DOCKET

SUPREME COURT
OF THE UNITED STATES

No. 13-298
Title: Alice Corporation Pty. Ltd., Petitioner
v.
CLS Bank International, et al.
Docketed: September 6, 2013
Linked with 13A95
Lower Ct: United States Court of Appeals for the Federal Circuit
Case Nos.: (2011-1301)
Decision Date: May 10, 2013

Questions Presented

~~Date~~~	~~~~~~~Proceedings and Orders~~~~~~~~~~~~~~~~~~~~~
Jul 18 2013	Application (13A95) to extend the time to file a petition for a writ of certiorari from August 8, 2013 to September 6, 2013, submitted to The Chief Justice.
Jul 22 2013	Application (13A95) granted by The Chief Justice extending the time to file until September 6, 2013.
Sep 4 2013	Petition for a writ of certiorari filed. (Response due October 7, 2013)
Sep 9 2013	Consent to the filing of amicus curiae briefs, in support of either party or of neither party, received from counsel for the respondents.
Sep 11 2013	Order extending time to file response to petition to and including November 6, 2013.
Sep 13 2013	Letter of September 13, 2013, from counsel for respondents received.
Sep 13 2013	Consent to filing of amicus curiae briefs, in support of either party or neither party, received from counsel for petitioner Alice Corporation Pty. Ltd..
Oct 4 2013	Brief amicus curiae of Dale R. Cook filed.
Oct 4 2013	Brief amicus curiae of Electronic Frontier Foundation filed.
Oct 7 2013	Brief amici curiae of Trading Technologies International, et al. filed.
Oct 7 2013	Brief amicus curiae of Sigram Schindler Beteiligungsgesellschaft mbH filed.
Oct 7 2013	Brief amici curiae of Professor Lee Hollaar, and Peter K. Trzyna in support of neither party filed.
Oct 7 2013	Brief amicus curiae of Gibbons Institute of Law, Science and Technology in support of neither party filed.
Oct 7 2013	Brief amici curiae of Accenture Global Services, GmbH, et al. filed.
Oct 7 2013	Brief amicus curiae of Institute of Electrical and Electronics Engineers, Inc.-USA filed.
Oct 7 2013	Brief amicus curiae of Intellectual Property Law Association of Chicago filed.
Oct 7 2013	Brief amicus curiae of New York Intellectual Property Law Association filed.

Oct 7 2013	Brief amici curiae of Students of Patent Law filed.
Nov 6 2013	Brief of respondents CLS Bank International, et al. in opposition filed.
Nov 19 2013	Reply of petitioner Alice Corporation Pty. Ltd. filed.
Nov 20 2013	DISTRIBUTED for Conference of December 6, 2013.
Dec 6 2013	Petition GRANTED.
Dec 11 2013	Consent to the filing of amicus curiae briefs, in support of either party or of neither party, received from counsel for the respondents.
Dec 11 2013	Consent to the filing of amicus curiae briefs, in support of either party or of neither party, received from counsel for the petitioner.
Jan 8 2014	SET FOR ARGUMENT ON Monday, March 31, 2014
Jan 14 2014	Record received from U.S.D.C. District of Columbia. The record is electronic.
Jan 16 2014	Record received from U.S.C.A. Federal Circuit. 1 Box.
Jan 21 2014	Joint appendix (3 volumes) filed. (Statement of costs filed)
Jan 21 2014	Brief of petitioner Alice Corporation Pty. Ltd. filed.
Jan 22 2014	Brief amicus curiae of Retailers in support of neither party filed.
Jan 23 2014	Brief amicus curiae of Dale R. Cook filed.
Jan 27 2014	Brief amicus curiae of Paul R. Michel in support of neither party filed.
Jan 27 2014	Brief amicus curiae of International Association for the Protection of Intellectual Property in support of neither party filed.
Jan 27 2014	Brief amicus curiae of Professor Lee Hollaar, and Peter K. Trzyna in support of neither party filed.
Jan 27 2014	Brief amicus curiae of Proove Biosciences, Inc. in support of neither party filed.
Jan 27 2014	Brief amicus curiae of American Intellectual Property Law Association in support of neither party filed.
Jan 27 2014	Brief amici curiae of James B. Lampert, and David A. Chavous in support of neither party filed.
Jan 28 2014	Brief amicus curiae of Sigram Schindler Beteiligungsgesellschaft mbH in support of neither party filed.
Jan 28 2014	Brief amicus curiae of International Business Machines Corporation in support of neither party filed.
Jan 28 2014	Brief amici curiae of Trading Technologies International, Inc., et al. filed.
Jan 28 2014	Brief amicus curiae of Intellectual Property Law Association of Chicago in support of neither party filed.
Jan 28 2014	Brief amici curiae of Professor Robin Feldman, and U.C. Hastings Institute for Innovation Law, in support of neither party filed.
Jan 28 2014	Brief amicus curiae of SHFL entertainment, Inc. in support of neither party filed.
Jan 28 2014	Brief amicus curiae of Brian R. Galvin in support of neither party filed.
Jan 28 2014	Brief amicus curiae of Conejo Valley Bar Association in support of neither party filed.
Jan 28 2014	Brief amicus curiae of Margo Livesay Ph.D. in support of neither party filed.
Jan 28 2014	Brief amicus curiae of IEEE-USA in support of neither party filed.
Jan 28 2014	Brief amicus curiae of New York Intellectual Property Law Association in support of neither party filed.
Jan 28 2014	Brief amicus curiae of Association of the Bar of the City of New York in support of neither party filed.

Jan 28 2014	Brief amicus curiae of Advanced Biological Laboratories, SA filed.
Jan 28 2014	Brief amicus curiae of Ronald M. Benrey in support of neither party filed.
Jan 28 2014	Brief amicus curiae of Intellectual Property Owners Association filed.
Feb 3 2014	CIRCULATED.
Feb 11 2014	Letter received from counsel for amicius curiae Ronald M. Benrey proposing a lodging of the book entitled "Understanding Digital Computers" (1964). Distributed.
Feb 20 2014	Brief of respondents CLS Bank International, et al. filed. (Distributed)
Feb 24 2014	Brief amicus curiae of The Juhasz Law Firm, P.C. filed. (Distributed)
Feb 26 2014	Brief amici curiae of Public Knowledge, et al. filed. (Distributed)
Feb 26 2014	Brief amicus curiae of the United States filed. (Distributed)
Feb 26 2014	Brief amicus curiae of American Civil Liberties Union filed. (Distributed)
Feb 26 2014	Brief amici curiae of Law, Business, and Economics Scholars filed. (Distributed)
Feb 26 2014	Brief amicus curiae of Red Hat, Inc. filed. (Distributed)
Feb 27 2014	Brief amicus curiae of Tony Dutra filed. (Distributed)
Feb 27 2014	Brief amicus curiae of BSA / The Software Alliance filed. (Distributed)
Feb 27 2014	Brief amici curiae of RichRelevance, Inc., et al. filed. (Distributed)
Feb 27 2014	Brief amici curiae of Software Freedom Law Center, et al. filed. (Distributed)
Feb 27 2014	Brief amici curiae of Professors Peter S. Menell and Jeffrey A. Lefstin filed. (Distributed)
Feb 27 2014	Brief amici curiae of Microsoft Corporation, et al. filed. (Distributed)
Feb 27 2014	Brief amici curiae of Checkpoint Software, Inc., et al. filed.
Feb 27 2014	Brief amici curiae of Google Inc., et al. filed. (Distributed)
Feb 27 2014	Brief amicus curiae of Electronic Frontier Foundation filed. (Distributed)
Feb 27 2014	Brief amicus curiae of Computer & Communications Industry Association filed. (Distributed)
Feb 27 2014	Motion of the Solicitor General for leave to participate in oral argument as amicus curiae and for divided argument filed.
Feb 27 2014	Brief amicus curiae of American Antitrust Institute filed. (Distributed)
Feb 27 2014	Brief amici curiae of The Clearing House Association L.L.C., et al. filed. (Distributed)
Mar 19 2014	Reply of petitioner Alice Corporation Pty. Ltd. filed. (Distributed)
Mar 21 2014	Motion of the Solicitor General for leave to participate in oral argument as amicus curiae and for divided argument GRANTED.
Mar 31 2014	Argued. For petitioner: Carter G. Phillips, Washington, D. C. For respondents: Mark A. Perry, Washington, D. C.; and Donald B. Verrilli, Jr., Solicitor General, Department of Justice, Washington, D. C. (for United States, as amicus curiae.)

PETITION FOR WRIT OF CERTIORARI

RECORD
AND
BRIEFS

13-298
No. 13-

IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR A WRIT OF CERTIORARI

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QUESTION PRESENTED

Whether claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

PARTIES TO THE PROCEEDING

All parties to the proceeding are identified in the caption.

RULE 29.6 STATEMENT

The sole parent corporation or publicly held company that owns 10 percent or more of the stock of Petitioner Alice Corporation Pty. Ltd. is National Australia Bank Limited.

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PETITION FOR A WRIT OF CERTIORARI

Alice Corporation Pty. Ltd. ("Alice") respectfully petitions for a writ of certiorari to review the judgment of the en banc Federal Circuit in this case.

OPINIONS BELOW

The opinion of the United States District Court for the District of Columbia is reproduced in the appendix to this petition (Pet. App.) at 172a-238a, and reported at 768 F. Supp. 2d 221. The Federal Circuit panel decision is reproduced at Pet. App. 132a-71a, and reported at 685 F.3d 1341. The order of the court of appeals granting rehearing en banc is reproduced at Pet. App. 239a-41a, and is available at 484 F. App'x 559. The numerous opinions of the Judges of the Federal Circuit sitting en banc are reproduced at Pet. App. 1a-131a, and reported at 717 F.3d 1269.

JURISDICTION

A panel of the court of appeals entered judgment on July 9, 2012. Pet. App. 132a. A timely petition for rehearing en banc was granted on October 9, 2012. Pet. App. 239a. The en banc court entered judgment on May 10, 2013. Pet. App. 1a. On July 22, 2013, the Chief Justice granted Alice an extension of time to and including September 6, 2013, within which to file a petition for a writ of certiorari. This Court has jurisdiction pursuant to 28 U.S.C. § 1254(1).

STATUTORY PROVISIONS INVOLVED

Section 101 of the Patent Act provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101.

INTRODUCTION

The Federal Circuit granted rehearing en banc in this case to address two fundamental and important questions relating to the patent eligibility of inventions that involve the use of computers: (1) "What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible 'abstract idea'; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise ineligible abstract idea?" and (2) "In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium ...?" Pet. App. 240a. Technology companies, practitioners, commentators, and district courts all anticipated that the en banc court would use this case to set forth clearer guidance for determining whether, and if so, under what circumstances computer-implemented inventions qualify as patent-eligible subject matter under section 101.

Unfortunately, far from providing clearer guidance, the Federal Circuit issued six separate opinions spanning more than 125 pages, none of which reflected an approach endorsed by a majority. The court split 5-5 with respect to Alice's claims to computer system inventions, leaving in place the district court's original summary judgment ruling holding them non-patentable. Alice's remaining claims were held non-patentable, although for different, and inconsistent, reasons. As a result, the legal standards that govern whether computer-implemented inventions are eligible for patent protection under section 101 remain entirely unclear and utterly panel dependent. As Judge Newman put it in her separate opinion, the court below

> propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation....
>
> ... Today's irresolution concerning section 101 affects not only this court and the trial courts, but also the PTO examiners and agency tribunals, and all who invent and invest in new technology.

Pet. App. 100a.

The Federal Circuit has left no doubt that it is irreconcilably fractured. The uncertainty that now plagues—and will, absent this Court's intervention, continue to plague—the patent system will cause severe harm and waste for innovators and litigants, as well as lower courts and the Patent and Trademark Office. Moreover, neither the judgment nor the analysis offered in the plurality opinion can be reconciled with this Court's precedents. What makes the current state of legal disarray completely intolerable is that patented inventions are the engine of much of the nation's and the world's economic growth, which will be needlessly stifled unless the standards for patentability are much clearer than they are today. The Court should grant certiorari in order to bring much-needed clarity to the application of section 101 to computer-implemented inventions.

STATEMENT OF THE CASE

I. STATUTORY BACKGROUND

The Patent Act confers on those who obtain a patent the right to exclude others from making, selling, or using the patented invention for a specified period of time. 35 U.S.C. § 154(a). A patent includes both a written description, or "specification," that describes the invention, and specific "claims" that "particularly point[] out and distinctly claim[] the subject matter which the inventor or a joint inventor regards as the invention." *Id.* § 112(a)-(b). The claims define the patented invention and set the boundaries of the patent right. *Markman* v. *Westview Instruments, Inc.*, 517 U.S. 370, 373 (1996). Patents commonly contain more than one claim, and the claims themselves commonly contain multiple elements or limitations.

The patent statute specifies what general subject matter is eligible for a patent—namely "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. "The general purpose of the statutory classes of subject matter is to limit patent protection to the field of applied technology, what the United States constitution calls 'the useful arts.'" 1 Donald S. Chisum, *Chisum on Patents* § 1.01 (2013) (quoting U.S. Const. art. I, § 8, cl. 8). In a series of decisions, including three recent ones, this Court has identified three exceptions to the statutory categories of patentable subject matter. See *Ass'n for Molecular Pathology* v. *Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013); *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012); *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010).[1] In particular, the Court has declared that "'laws of nature, natural phenomena, and abstract ideas'" lie outside the realm of patent-eligible subject matter. *E.g.*, *Myriad Genetics*, 133 S. Ct. at 2116.

Significantly, subject matter that fits within the scope of section 101 is merely ***eligible*** for a patent—not necessarily entitled to patent protection. Instead, a patent claim will not be granted, and if granted will be held "invalid," unless it satisfies specific requirements set forth in other provisions of the Patent Act. If, for instance, a claim covers what already has been done or disclosed, it is "anticipated," *i.e.*, invalid for lack of novelty. See 35 U.S.C. § 102. If a claim merely covers obvious modifications to what previously has been done or disclosed, it is invalid for "obviousness." *Id.* § 103; see *KSR Int'l Co.* v. *Teleflex, Inc.*, 550 U.S. 398, 417-18 (2007). If the patent specification does not provide a description that would permit one of ordinary skill in the art to implement the full scope of what is claimed without undue experimentation, the claim is invalid for lack of enablement. 35 U.S.C. § 112(a). While these and other statutory requirements must be satisfied before a patent claim can be validly enforced to prevent infringement, they do not limit what subject matter is patent-*eligible*. *E.g.*, *Parker* v. *Flook*, 437 U.S. 584, 588 (1978). That is solely the province of section 101.

The various categories of patent-eligible subject matter give rise to different types of patent claims, which fall into two general categories: claims that cover products and claims that cover methods. See 1

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[1] *See also Diamond* v. *Diehr*, 450 U.S. 175 (1981); *Parker* v. *Flook*, 437 U.S. 584 (1978); *Gottschalk* v. *Benson*, 409 U.S. 63 (1972).

Chisum on Patents § 1.02. Product claims relate to tangible items—*i.e.*, in the terms of section 101, "machine[s], manufacture[s], or composition[s] of matter." *Id.* In patent terms, claims to machines are often called "system" or "apparatus" claims. Also in the category of product claims are claims to computer programs embodied in tangible computer-readable media (such as a CD-ROM). *Id.* § 1.02[4]. Unlike product claims, "method" claims (also known, in the terms of section 101, as "process" claims) do not claim tangible matter, but instead recite a series of steps that lead to a useful result. See *id.* § 1.03.

II. PROCEEDINGS BELOW

A. The Invention.

Alice, which is half-owned by National Australia Bank Limited, was founded in the 1990s by Ian Shepherd, the inventor of the patents-in-suit. In the early 1990s, Mr. Shepherd, previously Managing Partner of the Melbourne, Australia, office of McKinsey & Company Inc., conceived of and later built a computerized system for creating and exchanging financial instruments such as derivatives.[2] Alice applied for and obtained patents, four of which are at issue in this case,[3] Pet. App. 2a, covering aspects of Mr. Shepherd's invention, known in the patents as the INVENTCO system. One aspect of the INVENTCO system, which is recited in the asserted claims,[4] relates to a specific computer system and computerized process for the execution of a previously agreed-upon exchange, known as "settlement." *Id.* at 42a-43a.

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[2] In general terms, a derivative is a financial instrument whose value is based on the value of an underlying asset, index, or security. *See, e.g., Analytical Surveys, Inc.* v. *Tonga Partners, L.P.*, 684 F.3d 36, 48 (2d Cir. 2012), *cert. denied*, 133 S. Ct. 1805 (2013). Commodity futures contracts, options, and swaps are examples of derivatives. *See* Timothy E. Lynch, *Derivatives: A Twenty-First Century Understanding*, 43 Loy. U. Chi. L.J. 1, 20-21 (2011).

[3] U.S. Patent Nos. 5,970,479 ("the '479 patent"), 6,912,510 ("the '510 patent"), 7,149,720 ("the '720 patent"), and 7,725,375 ("the '375 patent").

Typically, when parties agree to exchange particular financial assets or instruments—such as, for example, currencies—their agreement to make the exchange occurs prior to, and separate from, the actual exchange itself. Thus, for example, while parties may agree on Monday to trade a certain number of dollars for a certain number of euros, the actual exchange will not occur until sometime later, typically several days. This later execution of the parties' previously agreed-upon trade is referred to as settlement. A major risk in this sort of transaction is that one party will perform and send its portion of the exchange at the time for settlement, but the other party will not. Pet. App. 42a-43a.

Mr. Shepherd's invention addresses this problem by using a specially programmed computer to perform settlements in a particular way that mitigates or eliminates the risk that one party to an exchange will perform without the other doing so. In the invention, a computer system electronically maintains accounts for each party (described in the claims as "first" and "third" accounts). These accounts correspond to, but are independent from, "real-world" exchange accounts (described as "second" and "fourth" accounts in the claims) at an exchange institution or institutions (such as a central bank, in the case of currency trades). Pet. App. 71a-72a ('375 patent, claim 26).

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[4] JA365-67, 528-30, 688-89, 849-51.

Upon receiving a transaction from the user, and after ensuring that there is adequate value in each party's account, the computer (in real time) adjusts the accounts it maintains so as to effect the exchange in those accounts. *Id.* at 72a. If either party's account lacks adequate value, the computer will not effect the exchange. Finally, sometime thereafter (for example, at the end of the day), the computer automatically generates an instruction to the exchange institution or institutions to carry out the transaction in their "real-world" accounts. *Id.* For example, in the case of currency settlements, the system might generate and send instructions to the U.S. Federal Reserve Bank and the European Central Bank to move dollars and euros to the parties' accounts maintained with those central banks.

The asserted claims include system, computer-readable media, and method claims. Claim 26 of the '375 patent is typical of Alice's system claims. Pet. App. 71a-72a. That claim recites:

> A data processing system to enable the exchange of an obligation between parties, the system comprising:
>
> a communications controller,
>
> a first party device, coupled to said communications controller,
>
> a data storage unit having stored therein
>
> (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and
>
> (b) information about a third account for a second party, independent from a fourth

> account maintained by a second exchange institution; and
>
> a computer, coupled to said data storage unit and said communications controller, that is configured to
>
> (a) receive a transaction from said first party device via said communications controller;
>
> (b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and
>
> (c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

Id. at 71a-72a (emphases omitted). In other words, the claim recites a computer and other hardware, as well as the structural configuration of that hardware, specifically programmed to solve, in a particular way, the complex problem of settlement risk to which the invention is directed. *Id.* Thus, the computer in claim 26 is configured to receive transactions from the parties to an exchange, to adjust electronically the accounts maintained by the computer, and to generate instructions to the exchange institutions to implement the exchange in the separate accounts maintained by those institutions. *Id.* The common specification that underlies all of the patents, including the '375 patent, contains flowcharts that provide algorithm support for the specific programming to implement functions recited in the claims. *Id.* at 74a-75a (reproducing an example flowchart, Fig. 16 from the '375 patent).

Claim 33 of the '479 patent is typical of the method claims that cover the computerized process Mr. Shepherd invented. Pet. App. 26a-27a. That claim recites a method for mitigating settlement risk, as the claimed computer system does, through the use of electronic "shadow credit record[s]" and "shadow debit record[s]" held by a "supervisory institution." *Id.* The electronic shadow records reflect the balances in the transacting parties' real-world accounts held at "exchange institutions," and are updated in real time by the supervisory institution as transactions are entered, permitting only those transactions for which the parties' updated shadow records indicate sufficient resources to satisfy their mutual obligations. *Id.* at 27a. At the end of the day, the supervisory institution instructs the exchange institutions to irrevocably exchange credits and debits in the parties' real-world accounts to effect the agreed-upon and permitted transactions. *Id.*[5] It is undisputed that all of the recited method claims require implementation by a computer. *Id.* at 28a.

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[5] Claim 39 of the '375 patent, a representative computer-readable medium claim, recites "a computer readable storage medium having computer readable program code embodied in the medium for use by a party to exchange an obligation between a first party and a second party" in a manner similar to the method recited in claim 33 of the '479 patent. Pet. App. 32a (emphasis omitted).

B. Lower Court Proceedings.

In May 2007, CLS Bank International and CLS Services Ltd. (collectively, "CLS Bank") sued Alice in federal court, pursuant to 28 U.S.C. §§ 1331 and 1338(a), for a declaratory judgment that the asserted claims are invalid, unenforceable, or otherwise not infringed. Alice counterclaimed, alleging that CLS Bank infringed various claims. The parties filed cross-motions for summary judgment on whether the asserted claims define patent-eligible subject matter under section 101. The court granted CLS Bank's motion and denied Alice's, holding that none of the asserted claims defines patent-eligible subject matter. Pet. App. 172a-238a.

A divided panel of the Federal Circuit reversed. The panel majority (Judges Linn and O'Malley) held that the asserted claims "cover the practical application of a business concept in a specific way, which requires computer implemented steps." Pet. App. 159a. Although the asserted claims "fall within different statutory categories"—*i.e.*, system, process, and manufacture claims—the majority reached the same conclusion regarding all of the claims. *Id.* at 154a. Judge Prost dissented.

The Federal Circuit granted CLS Bank's petition for en banc rehearing. Pet. App. 240a. The court instructed the parties to submit additional briefs addressing the following questions:

> a. What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible "abstract idea"; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent-ineligible idea?

> b. In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium; and should such claims at times be considered equivalent for § 101 purposes?

Id. The court invited amicus participation, *id.* at 241a, and 25 briefs were submitted on behalf of 47 amici.

C. En Banc Decision.

The en banc court produced a one-paragraph per curiam opinion, five concurring and dissenting opinions, and "additional reflections" by Chief Judge Rader. Pet. App. 1a-131a. Seven of the ten participating judges voted to affirm the district court's decision that the asserted method and computer-readable media claims were not directed to eligible subject matter, but there was no majority as to the proper reasoning to apply. As for the system claims, there was no majority as to reasoning or result, and the judgment was affirmed by an equally divided court.

1. Writing for himself and Judges Dyk, Prost, Reyna, and Wallach, Judge Lourie concurred in the decision to affirm, taking the position that none of the asserted claims was directed to eligible subject matter. Acknowledging that "the patent-eligibility test has proven quite difficult to apply," Judge Lourie sought to propose an "analysis [that] should apply in determining whether a computer-implemented claim recites patent-eligible subject matter." Pet. App. 10a, 19a.

The first question, Judge Lourie wrote, is whether the invention fits within one of section 101's four classes of eligible subject matter. If so, the court must assess whether "the claim pose[s] any risk of preempting an abstract idea[.]" Pet. App. 20a. If there is such a risk, it is then "important ... to identify and define whatever fundamental concept appears wrapped up in the claim." *Id.* Indeed, Judge Lourie reiterated, "one cannot meaningfully evaluate whether a claim preempts an abstract idea until the idea supposedly at risk of preemption has been unambiguously identified." *Id.* The next step is to examine "the balance of the claim." Pet. App. 20a-21a. According to Judge Lourie, the question in reviewing "'the balance of the claim'" is whether it reflects an "inventive concept"[6]—*i.e.*, "human contribution [that] represent[s] more than a trivial appendix to the underlying abstract idea." *Id.* at 22a.

Judge Lourie next applied his analytical framework to Alice's asserted claims, beginning with the method claims. First, he stated that "[t]he methods claimed here draw on the abstract idea of reducing settlement risk by effecting trades through a third-party intermediary (here, the supervisory institution) empowered to verify that both parties can fulfill their obligations before allowing the exchange—*i.e.*, a form of escrow." Pet. App. 28a. He then reviewed the remaining claim limitations one by one, concluding that "none of [them] adds anything of substance to the claim." *Id.* at 29a. In particular, as to the requirement for computer implementation, he stated that "simply appending generic computer functionality to lend speed or efficiency to the performance of an otherwise abstract concept does not meaningfully limit claim scope for purposes of patent eligibility." *Id.* More broadly, he explained, "[a]t its most basic, a computer is just a calculator capable of performing mental steps faster than a human could. Unless the claims require a computer to perform operations that are not merely accelerated calculations, a computer does not itself confer patent eligibility." *Id.* at 30a. The computer-readable medium claim was subject to essentially the same analysis because it was drawn "'to the underlying method'" set forth in the process claims. *Id.* at 33a-34a.

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[6] Judge Lourie recognized that, despite his use of the term "inventive," questions of novelty are "'of no relevance in determining whether the subject matter of a claim falls within the § 101 categories.'" Pet. App. 21a-22a (quoting *Diehr*, 450 U.S. at 188-89).

Judge Lourie next concluded that the computer system claims were also indistinguishable from the method claims. Although the system claims recited "physical objects," namely computer hardware, Judge Lourie opined that those objects were described "in generic, functional terms," as equipment capable of "carry[ing] out the otherwise abstract methods recited" in the method claims. Pet. App. 36a-39a. Although Judge Lourie recognized that "a computer *per se*" is "surely [a] patent-eligible machin[e]," in his view that was not true of Alice's claimed computer system. *Id.* at 41a. Instead, Judge Lourie stated, the claimed system was better described as "abstract methods coupled with computers adapted to perform those methods." *Id.*

2. Chief Judge Rader wrote an opinion dissenting in part and concurring in part, which was joined by Judges Linn, Moore, and O'Malley.[7] Chief Judge Rader "beg[a]n with the text of the statute." Pet. App. 45a. He noted the breadth of section 101, and that it "both uses expansive categories and modifies them with the word 'any.'" *Id.* at 46a. He also noted that

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[7] As explained below, Part VI of Chief Judge Rader's opinion was joined only by Judge Moore. Pet. App. 41a.

when the statute was amended in 1952, it was made even more sweeping—by, among other things, expanding the definition of "invention" in section 100(a) to mean "invention or discovery"—so that patent eligibility would extend to "'anything that is under the sun that is made by man.'" *Id.* at 48a. Moreover, the 1952 amendment also moved "any need for an 'invention' or 'inventiveness' measure" out of the test for patent-eligibility, replacing it with the "objective test for 'obviousness' in Section 103." *Id.* at 50a.

Chief Judge Rader next observed that the exceptions to patent-eligibility that this Court has identified focus on whether "the asserted claim *as a whole*" covers "merely an abstract idea." Pet. App. 53a-54a. Reviewing the claim "*as a whole*" is essential, because "[a]ny claim can be stripped down, simplified, generalized, or paraphrased to remove all of its concrete limitations, until at its core, something that could be characterized as an abstract idea is revealed." *Id.* at 54a. In determining whether a claim, as a whole, covers merely an abstract idea, the relevant inquiry is whether the claim "includes *meaningful* limitations restricting it to an application." *Id.* at 57a. A claim that "covers all practical applications of an abstract idea," or that "contains only insignificant or token pre- or post-solution activity" "is not meaningfully limited." *Id.* at 58a-60a. As applied to a computer-implemented claim, the meaningful-limitation inquiry asks "whether the claims tie the otherwise abstract idea to a *specific way* of doing something with a computer, or a *specific computer* for doing something; if so, they likely will be patent eligible, unlike claims directed to *nothing more than the idea* of doing something on a computer." *Id.* at 62a. Finally, Chief Judge Rader observed that like all "judge-made exceptions to properly enacted statutes," the exception for abstract ideas should be "narrowly construed" in order to avoid "improper narrowing" of the scope of section 101. *Id.* at 66a.

Applying his analytical framework to the asserted claims, beginning with the system claims, Chief Judge Rader stated at the outset that "[c]omputers are 'machines.'" Pet. App. 69a. Citing this Court's observation in *Bilski* that a method claim's reliance on a machine is a "useful and important clue" to patent-eligibility, 130 S. Ct. at 3227, Chief Judge Rader observed that "[i]f tying a method to a machine can be an important indication of patent-eligibility, it would seem that a claim embodying the *machine itself*, with all its structural and functional limitations, would rarely, if ever, be an abstract idea." Pet. App. 70a. Looking to claim 26 of the '375 patent, one of the representative computer system claims, Chief Judge Rader observed that the claim "covers the use of a computer and other hardware specifically programmed to solve a complex problem." *Id.* at 73a. In addition to the hardware recited in the claim, the specification "discloses at least thirty-two figures which provide detailed algorithms for the software with which this hardware is to be programmed," and "explains implementation of the recited special purpose computer system[s]." *Id.* Moreover, the claimed system is not coextensive with the "abstract concept" of escrow generally: "[t]he recited steps are not inherent in the process of using an escrow," and "someone can use an escrow arrangement in many other applications, without computer systems, and even with computers but in other ways without infringing the claims." *Id.* at 77a-78a.

In a part of his opinion joined only by Judge Moore, Chief Judge Rader concluded that the method and computer-readable medium claims are not directed to eligible subject matter. He opined that the method claims "describe[] the general and theoretical concept of using a neutral intermediary in exchange transactions to reduce risk that one party will not honor the deal," and concluded that each of the steps in the claimed method was "an inherent part" of such an escrow arrangement. Pet. App. 82a. The claims' reference to computer implementation was "not, by itself, enough." *Id.* at 84a. Thus, Chief Judge Rader stated, "like Judge Lourie, we [Chief Judge Rader and Judge Moore] would hold the method claims in this case are not eligible under Section 101, but would do so for different reasons than he articulates." *Id.*

3. Judge Moore filed an additional opinion dissenting in part, which was joined by Chief Judge Rader and Judges Linn and O'Malley. Judge Moore underscored both the importance of the issue before the court and the flaws in Judge Lourie's analysis. As to the first point, Judge Moore observed that "lumping together the asserted method, media, and system claims" and "[h]olding that all of these claims are directed to no more than an abstract idea gives staggering breadth to what is meant to be a narrow judicial exception." Pet. App. 85a. In fact, Judge Moore wrote, "if all of these claims, including the system claims, are not patent-eligible, this case is the death of hundreds of thousands of patents, including all business method, financial system, and software patents as well as many computer implemented and telecommunications patents." *Id.* at 86a. Adopting Judge Lourie's reasoning "would decimate the electronics and software industries." *Id.* at 86a n.1.

As to the second point, Judge Lourie erred, Judge Moore explained, by misreading this Court's precedents. Judge Lourie failed to recognize the indication in *Bilski* that "a method claim's recitation of machine limitations is a 'useful and important clue' that the claim is patent-eligible." Pet. App. 88a. Echoing Chief Judge Rader, Judge Moore explained that "if meaningfully tying a method to a machine can be an important indication of patent-eligibility, how can a claim to the *machine itself*, with all its structural and functional limitations, *not* be patent-eligible?" *Id.* Judge Lourie also misapplied the "inventive concept" language that this Court used in *Mayo* to "imbue[] the § 101 inquiry with a time-dependency that is more appropriately the province of §§ 102 and 103.... [Section] 101 is not a moving target—claims should not become abstract simply through the passage of time." *Id.* at 90a.

4. Judge Newman wrote a separate opinion concurring in part and dissenting in part. She agreed that the claims must stand or fall together, but opined that all were directed to eligible subject matter. Pet. App. 113a. She emphasized that the Federal Circuit's inability to provide definite guidance as to the meaning of section 101 will "simply ... add to the unreliability and cost of the system of patents as an incentive for innovation." *Id.* at 100a. The result of the Federal Circuit's impasse "is that any successful innovation is likely to be challenged in opportunistic litigation, whose result will depend on the random selection of the panel." *Id.*

5. Judge Linn, joined by Judge O'Malley, wrote an opinion concluding, as they had when they made up the panel majority, that all of Alice's claims are patent-eligible, because all are "grounded by the same meaningful limitations." Pet. App. 113a-14a.

Judge Lourie's analysis was flawed, Judge Linn explained, because it "strip[ped] the claims of their detail and limitations" in direct contravention of this Court's instruction in *Diehr* that section 101 be applied to the claims as a whole, an error that resulted in a "paraphrased abstraction of the claims" that "preordained[ed]" Judge Lourie's conclusion that they were not patent-eligible. *Id.* at 121a. Chief Judge Rader, in contrast, had properly analyzed the computer system claims, but erred as to the method and computer-readable medium claims because he failed to recognize, as the record made clear and CLS Bank had stipulated, that *all* of the claims require electronic implementation on a computer. *Id.* at 118a-19a. Once the method and medium claims are properly understood to require all of the computer-implemented limitations of the system claims, they neither are abstract, nor do they preempt all commercial uses or applications of the supposed abstract idea of using an intermediary to facilitate financial transactions. *Id.* at 124a.

6. Finally, Chief Judge Rader offered further views in a statement denominated "Additional Reflections." He bemoaned the departure in section 101 jurisprudence from the text of the statute, and the lack of clarity that the departure has caused. Pet. App. 127a-30a. In particular,

> to inject the patentability test of "inventiveness" into the separate statutory concept of subject matter eligibility makes this doctrine again "the plaything of the judges who, as they became initiated into its mysteries, delighted to devise and expound their own ideas of what it meant; some very lovely prose resulting."

Id. at 130a (quoting Giles S. Rich, *Principles of Patentability*, 28 Geo. Wash. L. Rev. 393, 404 (1960)).

REASONS FOR GRANTING THE PETITION

I. NO CLEAR STANDARD EXISTS, AND THE FEDERAL CIRCUIT IS ADMITTEDLY AND HOPELESSLY FRACTURED.

Although this Court has examined section 101 on several occasions in recent years, it has not addressed the application of section 101 to a computer-implemented invention in more than three decades. And it has never examined the application of section 101 in the context of computer-based systems or software. In the time since *Diehr*, *Benson*, and *Flook*, both dramatic changes in information technology and evolution in this Court's reading of section 101—particularly in *Bilski* and *Mayo*—have given rise to tremendous uncertainty as to the application of section 101 to computer-implemented inventions.[8] Given the importance of computers and software to our nation's economy, the time is ripe for the Court to address these issues.

The Court need look no further than the Federal Circuit's inability to make a decision concerning the computer system claims, and the hundreds of pages of opinions proposing approaches on which a majority of the court could not agree, to recognize the enormous confusion that exists. The opinions are replete with observations that the application of section 101 to computer-implemented inventions remains plagued with uncertainties that have caused and will continue to cause confusion in the courts and before the Patent and Trademark Office, as well as harm to innovation in the information technology field and beyond. Pet. App. 10a ("the patent-eligibility test has proven quite difficult to apply") (Lourie, J.); *id.* at 85a ("the current interpretation of § 101, and in particular the abstract idea exception, is causing a free fall in the patent system") (Moore, J.); *id.* at 87a ("Our court is irreconcilably fractured ....") (Moore, J.); *id.* at 100a ("we have propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation") (Newman, J.); *id.* at 129a ("The intervening commotion [since *Diehr* and other decisions] leaves us with little, if any, agreement amongst us even though the statute has not changed a syllable.") (Rader, C.J.).

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[8] This Court's opinion in *Myriad* was issued after the decision below and was not considered by the en banc Federal Circuit. However, *Myriad* addressed a different judicial exception to patent-eligibility (natural phenomena) applied to an entirely different industry (gene sequencing). *See* 133 S. Ct. at 2111-13. Accordingly, *Myriad* would not likely have changed the outcome or reasoning offered here. Indeed, as described at p. 23-24, *infra*, precisely the same dispute that prevented consensus in this case similarly fractured the Federal Circuit's decision in *Ultramercial, Inc.* v. *Hulu, Inc.*, 2013 WL 3111303 (Fed. Cir. June 21, 2013), *petition for cert. filed*, No. 13-255 (Aug. 23, 2013), issued *after Myriad* was handed down.

The decision here is no isolated incident. Since this Court's decision in *Bilski*, the Federal Circuit has repeatedly employed different, and inconsistent, tests to evaluate computer-implemented inventions. Compare, *e.g.*, *Research Corp. Techs., Inc.* v. *Microsoft Corp.*, 627 F.3d 859, 868 (Fed. Cir. 2010) (computer-implemented invention is ineligible subject matter only where abstractness "exhibit[s] itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act"), and *Ultramercial, LLC* v. *Hulu, LLC*, 657 F.3d 1323, 1330 (Fed. Cir. 2011) ("as a practical application of the general concept of advertising as currency and an improvement to prior art technology, the claimed invention is not 'so manifestly abstract as to override the statutory language of section 101.'"), *vacated*, 132 S. Ct. 2431 (2012), with *Bancorp Servs., LLC* v. *Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) ("To salvage an otherwise patent-ineligible process, a computer must be *integral* to the claimed invention, facilitating the process in a way that a person making calculations or computations could not.") (emphasis added), and *Cybersource Corp.* v. *Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011) (asking whether computer-focused limitation "impose[d] a sufficiently meaningful limit on the claim's scope" and whether the computer "'play[ed] a significant part in permitting the claimed method to be performed.'"). As the Federal Circuit observed in 2012, "[o]ur opinions spend page after page revisiting our cases and those of the Supreme Court, and still we continue to disagree vigorously over what is or is not patentable subject matter." *MySpace, Inc.* v. *GraphOn Corp.*, 672 F.3d 1250, 1259 (Fed. Cir. 2012) (citing *Dealertrack, Inc.* v. *Huber,* 674 F.3d 1315 (Fed. Cir. 2012) (Plager, J., dissenting-in-part); *Classen Immunotherapies, Inc.* v. *Biogen IDEC,* 659 F.3d 1057 (Fed. Cir. 2011) (Moore, J.; dissenting); *Ass'n for Molecular Pathology* v. *U.S. Patent & Trademark Office,* 653 F.3d 1329 (Fed. Cir. 2011) (concurring opinion by Moore, J., dissenting opinion by Bryson, J.); *In re Ferguson,* 558 F.3d 1359 (Fed. Cir. 2009) (Newman, J., concurring)).

The Judges of the Federal Circuit have found the application of section 101 to be so uncertain that some have recommended that courts strive to steer clear of section 101's "murky morass" altogether, *MySpace*, 672 F.3d at 1260, notwithstanding section 101's status as a "threshold test," *Bilski*, 130 S. Ct. at

3225. In *MySpace*, Judge Plager writing for the majority suggested that "courts could avoid the swamp of verbiage that is § 101 by exercising their inherent power to control the processes of litigation, and insist that litigants initially address patent invalidity issues in terms of the conditions of patentability defenses as the statute provides, specifically §§ 102, 103, and 112." 672 F.3d at 1260 (citation omitted). If courts were to do so, "it would be unnecessary to enter the murky morass that is § 101 jurisprudence." *Id.*; see also Dennis Crouch & Robert P. Merges, *Operating Efficiently Post-Bilski by Ordering Patent Doctrine Decision-Marking*, 25 Berkeley Tech. L.J. 1673, 1674, 1678 (2010) (suggesting, in light of the "bedeviling lack of guidance over what patent applicants and patentees can expect when § 101 is applied to a specific patent claim," that patent-eligibility "be considered only when doing so is absolutely necessary").

Of course, no competent lawyer would advise an alleged infringer not to raise a section 101 defense, and district courts presumably will follow this Court's admonition that section 101 is a "threshold" test and at least some will apply section 101 formulations adopted by particular Federal Circuit panels that will potentially sweep protracted and complicated patent litigation off their dockets. It is fanciful to think that a district court will find wading into the "morass" of section 101 more daunting than the analysis of complicated technology that is often required by sections 102, 103, and 112.

And the conflict over the meaning of section 101 has continued, even in the short time since the decision below. One month after the en banc ruling—and eight days after this Court's decision in *Myriad*—the same debate played out again in *Ultramercial,* *LLC* v. *Hulu, LLC*, 2013 WL 3111303 (Fed. Cir. June 21, 2013). There, Chief Judge Rader, writing for the panel majority, offered much the same analysis of section 101 as that recounted in his opinion in this case. Compare Pet. App. 45a-52a, with *Ultramercial*, 2013 WL 3111303, at *4-13. For his part, Judge Lourie submitted an opinion concurring in the judgment in which he reiterated the same views offered in *his* opinion below. *Ultramercial*, 2013 WL 3111303, at *17-18 ("I write separately because I believe that we should concisely and faithfully follow the Supreme Court's most recent guidance regarding patent eligibility in *Mayo* ..., and should track the plurality opinion of five judges from this court in *CLS Bank International* v. *Alice Corp*.") (citations omitted). Indeed, even the *Ultramercial* panel's discussion of the *procedural* aspects of that case was affected by the lack of a governing standard for the application of section 101. *See id.* at *3. The losing party in *Ultramercial* recently filed its own petition (No. 13-255) seeking review of the conflict stemming from the en banc decision in this case.

There is no prospect that this dispute or uncertainty will be resolved by the Federal Circuit. The court of appeals reheard this case en banc for the specific purpose of establishing a standard for assessing the patent-eligibility of computer-implemented inventions. See Pet. App. 240a. After hearing from the parties and from amici representing the full spectrum of the patent bar; the information technology, e-commerce, financial services, and other industries; and the United States, the court utterly failed to provide any meaningful guidance. See, *e.g.*, *id.* at 99a-100a ("The court, now rehearing this case en banc, hoped to ameliorate this uncertainty by providing objective standards for section 101 patent-eligibility. Instead we have propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation.") (Newman, J.). Indeed, Judge Moore's opinion, joined by three other judges, all but begs this Court to intervene:

> Our court is irreconcilably fractured over these system claims and there are many similar cases pending before our court and the district courts. It has been a very long time indeed since the Supreme Court has taken a case which contains patent eligible claims. This case presents the opportunity for the Supreme Court to distinguish between claims that *are* and *are not* directed to patentable subject matter.

Id. at 87a. The Court should respond to Judge Moore's plea by reviewing this case.

II. THE JUDGMENT BELOW CONFLICTS WITH THIS COURT'S PRECEDENTS.

The Court also should grant review to establish that the judgment below—and particularly the approach set forth in Judge Lourie's plurality opinion, which the Federal Circuit has elsewhere applied in precedential decisions[9]—conflicts with this Court's precedents. Indeed, the plurality's approach cannot be reconciled with this Court's opinion in *Diehr*, which was reaffirmed in both *Bilski*, 130 S. Ct. at 3229-30, and *Mayo*, 132 S. Ct. at 1298-99.

The first step in the plurality's approach to section 101 is to "unambiguously identif[y]" the abstract idea that is supposedly preempted by a patent claim. Pet. App. 20a. Next, "the balance of the claim" is evaluated to determine whether any specific limitations are sufficiently "'inventive'"—*i.e.*, representative of a "human contribution" that is not "merely tangential, routine, well-understood, or conventional." *Id.* at 20a-23a. But this Court expressly rejected such an approach in *Diehr*.

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[9] *E.g.*, *Bancorp*, 687 F.3d 1266.

In *Diehr*, this Court considered the patent-eligibility of a process for curing synthetic rubber, which included in several of its steps the use of a mathematical algorithm and a programmed computer. 450 U.S. 175, 177-78 (1981). The Court explained that it is fundamentally inappropriate to separate out the supposed abstract idea—in that case, the algorithm—from the "balance of the claim." *Id.* at 188-89. Instead, "claims must be considered as a whole. *It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis.*" *Id.* at 188 (emphasis added). Indeed, the petitioner in *Diehr* advocated an approach remarkably similar to the plurality's, arguing that "if everything other than the algorithm is determined to be old in the art, then the claim cannot recite statutory subject matter." *Id.* at 189 n.12. But this Court explicitly rejected that position, explaining that the analysis the petitioner proposed "would, if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious." *Id.* The same is true of the approach taken by the plurality here. See Pet. App. 48a-49a (Rader, C.J.) (criticizing the plurality's approach on this ground).

The Court in *Diehr* also made clear that the section 101 analysis should not turn on the novelty of any individual claim limitations—or even the claim as a whole. As the Court explained, "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is *of no relevance* in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Diehr*, 450 U.S. at 188-89 (emphasis added). The plurality's analysis, however, departs from this fundamental principle as well. Here, the plurality examined the limitations in the claimed methods to determine whether each was sufficiently "inventive" and not overly "well-understood" or "conventional." Pet. App. 21a-24a, 29a-31a.

Finally, the plurality, along with most of the other judges on the en banc court, concluded that all of the asserted claims—system, media, and method—should be treated alike on the ground that "the asserted method and system claims require performance of the same basic process." Pet. App. 39a. This conclusion, too, violates this Court's instruction that each claim must be considered *as a whole*, not by stripping away all of its limitations to look solely at the "gist" of the invention. *Diehr*, 450 U.S. at 188-89 & n.12; *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 345 (1961) ("[T]here is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention ...."). Moreover, as Chief Judge Rader and Judge Moore explained, this approach disregards the instruction of this Court in *Bilski* that connecting a method to a machine, as the asserted claims expressly and concretely do, is indicative of patent-eligibility, 130 S. Ct. at 3227: "[I]f meaningfully tying a method to a machine can be an important indication of patent-eligibility, how can a claim to the *machine itself*, with all its structural and functional limitations, *not* be patent-eligible?" Pet. App. 88a; *id.* at 70a.

The Court should take this opportunity to confirm that the approach to section 101 outlined in *Diehr* and reaffirmed in *Bilski* and other cases, which requires considering patent claims as a whole, is the proper way to analyze patent-eligibility under section 101, and that the approach reflected in the decision below is erroneous. As the panel majority recognized, under the proper analysis, Alice's asserted claims are directed to patent-eligible subject matter.

III. PROMPT INTERVENTION BY THIS COURT IS NEEDED TO AVOID CONFUSION IN THE LAW AND HARM TO INNOVATION.

Clear standards are essential in patent law. See, *e.g.*, *Bilski*, 130 S. Ct. at 3231 (Stevens, J., concurring in the judgment) ("In the area of patents, it is especially important that the law remain stable and clear."); *Festo Corp.* v. *Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 730-31 (2002). The absence of clear standards—particularly clear standards as to the definitional question of what constitutes patent-eligible subject matter—has dramatic implications for innovators, industry, and the broader economy.

The state of confusion that now exists concerning the patent-eligibility of computer-implemented inventions is no exception. As Judge Moore, writing for herself, Chief Judge Rader, and Judges Linn and O'Malley, put it: "the current interpretation of § 101, and in particular the abstract idea exception, is causing a free fall in the patent system." Pet. App. 85a. The fractured decision below creates the stark prospect that a host of inventions will now be declared unpatentable: "[I]f all of these claims, including the system claims, are not patent-eligible, this case is the death of hundreds of thousands of patents, including all business method, financial system, and software patents as well as many computer implemented and telecommunications patents." *Id.* at 85a-86a. Indeed, as Judge Moore explained, "[i]f the reasoning of Judge Lourie's opinion were adopted, it would decimate the electronics and software industries. There are of course, software, financial system, business method and telecom patents in other technology classes which would also be at risk." *Id.* at 86a n.1.

The uncertainty itself imposes real costs on courts, litigants, innovators, and the broader economy. With uncertainty comes increased litigation, and "[t]he ascendance of section 101 as an independent source of litigation, separate from the merits of patentability, is a new uncertainty for inventors." Pet. App. 99a (Newman, J.). The "deadlock" in the decision below means that "any successful innovation is likely to be challenged in opportunistic litigation, whose result will depend on the random selection of the panel." *Id.* at 100a. As Judge Newman summarized:

> Reliable application of legal principles underlies the economic incentive purpose of patent law, in turn implementing the benefits to the public of technology-based advances, and the benefits to the nation of industrial activity, employment, and economic growth. Today's irresolution concerning section 101 affects not only this court and the trial courts, but also the PTO examiners and agency tribunals, and all who invent and invest in new technology. The uncertainty of administrative and judicial outcome and the high cost of resolution are a disincentive to both innovators and competitors.

Id. Clearer guidance on standards in this area of critical importance to the economy is essential, but does not exist and cannot exist without this Court's intervention.

Even before the decision below, commentators heavily criticized the absence of clear standards for the application of section 101. See, *e.g.*, Jonathan Masur, *Patent Inflation*, 121 Yale L.J. 470, 529 (2011) (explaining that when "[f]aced with uncertain law" as to the patent-eligibility of computer-implemented inventions, "[t]he PTO found itself pushing the legal frontier without a clear signal from the Federal Circuit"); Donald S. Chisum, *Weeds and Seeds in the Supreme Court's Business Method Patent Decision: New Directions for Regulating Patent Scope*, 15 Lewis & Clark L. Rev. 11, 14 (2011) ("[T]he Section 101 abstract idea preemption inquiry can lead to subjectively-derived, arbitrary and unpredictable results."); Mark A. Lemley et al., *Life After Bilski*, 63 Stan. L. Rev. 1315, 1325 (2011). Indeed, one district court delayed its ruling on a section 101 issue while the en banc decision here was pending, based on the hope—which proved futile—that "help [was] on the way" in the form of a definitive statement from the Federal Circuit. *Zillow v. Trulia*, 2013 WL 594300, at *2 (W.D. Wash. Feb. 15, 2013). In the months since the decision, commentators have, in huge numbers,[10] decried the continued confused state of the law. See, *e.g.*, Gene Quinn, *Federal Circuit Nightmare in CLS Bank v. Alice Corp.*, IPWatchdog (May 10, 2013), http://www.ipwatchdog.com/2013/05/10/federal-circuit-nightmare-in-cls-bank-v-alice-corp/id=40230/ ("How is the Patent Office supposed to process this decision? How are patent examiners supposed to apply this monstrosity? How are patent practitioners supposed to write patent applications covering these important innovations."); Edward Van Gieson, *A Strategy for Dealing with the CLS Bank Decision,* Law360 (May 30, 2013), www.law360.com/articles/446251/a-strategy-for-dealing-with-the-cls-bank-decision ("It may be some years before any clear and consistent framework is articulated.").[11]

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[10] A Google search for the term "CLS Bank v. Alice" produces nearly 800,000 results.

Industry participants have demonstrated the importance of prompt resolution of this issue, with 25 briefs filed in the Federal Circuit on behalf of 47 amici, including Google, Dell, Facebook, IBM, and Philips. Numerous amici specifically addressed the effect that unpredictability in this area of patent law has on the information technology industry and the broader economy. See, *e.g.*, Brief of Amicus Curiae International Business Machines Corporation, at 3-4 ("Clarity and predictability in the patent law are imperative.... Certainty is especially critical in the information technology sector where computer-implemented inventions are commonplace."); Brief of Amicus Curiae Intellectual Property Owners Association at 3 ("The issue of patent eligibility of computer-implemented inventions is crucially important to ... the broader U.S. economy."); Brief of Amicus Curiae New York Intellectual Property Law

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[11] *See also* Robert A. Sachs, *CLS v. Alice: The Federal Circuit at a Jurisprudential Deadlock*, Bilski Blog (May 14, 2013), http://www.bilskiblog.com/blog/2013/05/cls-v-alice-the-federal-circuit-at-a-jurisprudential-deadlock.html; John Kong, *The Alice in Wonderland En Banc Decision by the Federal Circuit in CLS Bank v. Alice Corp*, IPWatchdog (May 14, 2013), http://www.ipwatchdog.com/2013/05/14/the-alice-in-wonderland-en-banc-decision-by-the-federal-circuit-in-cls-bank-v-alice-corp/id=40344/; Nelson R. Capes, *CLS Bank v. Alice Corp.: a new hermeneutic of suspicion*, Lexology (June 12, 2013), http://www.lexology.com/library/detail.aspx?g=be43dee6-08cf-4b1e-b56c-6d1b5f7f8f35.

Association at 2 ("Recently, the jurisprudence on patent-eligibility has placed a cloud over many patents, particularly computer-implemented inventions.").

Granting certiorari in this case will allow this Court in a timely way to resolve the uncertainty that is currently plaguing the district courts, the PTO, innovators, and industry. Indeed, this case presents the Court with a unique opportunity to examine whether claims to a variety of computer-implemented inventions—including method claims, computer-readable medium claims, and system claims—are directed to patent-eligible subject matter. While at some level of generality, claims that are directed to different statutory categories may cover similar inventions, claims that fall within different categories are not necessarily the same in scope. See, *e.g.*, *In re Kollar*, 286 F.3d 1326, 1332 (Fed. Cir. 2002). Claims that are drawn to different statutory categories are directed to different inventions and ordinarily have different limitations. By granting review in this case, this Court will have the ability to advise the lower courts, the PTO, and innovators on how the assessment of a system claim, which recites specifically configured computer hardware, may differ from that of a method claim, which recites use of a computer to perform a specific operation. Because the patent claims at issue here cover the full range of computer-related inventions—computer systems, computer-implemented methods, and computer-readable media—this case will allow the Court to craft a comprehensive, rather than piecemeal, approach to computer-related inventions.

CONCLUSION

For the foregoing reasons, the petition for a writ for certiorari should be granted.

Respectfully submitted,

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September 4, 2013

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APPENDIX

APPENDIX A

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

No. 2011-1301

CLS BANK INTERNATIONAL,
Plaintiff-Appellee,

and

CLS SERVICES LTD.,
Counterclaim Defendant-Appellee,

v.

ALICE CORPORATION PTY. LTD.,
Defendant-Appellant.

May 10, 2013

OPINION

Opinion for the court filed PER CURIAM.

Concurring opinion filed by LOURIE, Circuit Judge, in which DYK, PROST, REYNA, and WALLACH, Circuit Judges, join.

PER CURIAM.

Upon consideration en banc, a majority of the court affirms the district court's holding that the asserted

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[*] Circuit Judge Taranto did not participate in this decision.

method and computer-readable media claims are not directed to eligible subject matter under 35 U.S.C. § 101. An equally divided court affirms the district court's holding that the asserted system claims are not directed to eligible subject matter under that statute.

AFFIRMED

LOURIE, Circuit Judge, concurring, with whom Circuit Judges DYK, PROST, REYNA, and WALLACH join.

Alice Corporation ("Alice") appeals from the grant of summary judgment in favor of declaratory judgment plaintiffs CLS Bank International and CLS Services, Ltd. (collectively, "CLS") by the United States District Court for the District of Columbia holding that certain claims of Alice's U.S. Patents 5,970,479 (the "'479 patent"), 6,912,510 (the "'510 patent"), 7,149,720 (the "'720 patent"), and 7,725,375 (the "'375 patent") are invalid under 35 U.S.C. § 101. *CLS Bank Int'l v. Alice Corp.*, 768 F.Supp.2d 221 (D.D.C.2011). On July 9, 2012, a panel of this court reversed, holding that the claims at issue, including claims drawn to methods, computer-readable media, and systems, were all patent eligible under § 101. *CLS Bank Int'l v. Alice Corp.*, 685 F.3d 1341 (Fed.Cir.2012), *vacated*, 484 Fed.Appx. 559 (Fed.Cir.2012). CLS filed a petition for rehearing en banc, which was granted on October 9, 2012. *CLS Bank Int'l v. Alice Corp.*, 484 Fed.Appx. 559 (Fed.Cir.2012).

As described more fully below, we would affirm the district court's judgment in its entirety and hold that the method, computer-readable medium, and corresponding system claims before us recite patent-ineligible subject matter under 35 U.S.C. § 101.[1]

BACKGROUND

I. Alice's Patents

Alice, an Australian company, owns the '479, '510, '720, and '375 patents by assignment. The patents, which all derive from the same family and share substantially the same specification, concern "the management of risk relating to specified, yet unknown, future events." '479 patent col. 1, ll. 8-10. In particular, the patents relate to a computerized trading platform used for conducting financial transactions in which a third party settles obligations between a first and a second party so as to eliminate "counterparty" or "settlement" risk. *CLS Bank*, 768 F.Supp.2d at 224. Settlement risk refers to the risk to each party in an exchange that only one of the two parties will actually pay its obligation, leaving the paying party without its principal or the benefit of the counterparty's performance. Alice's patents address that risk by relying on a trusted third party to ensure the exchange of either both parties' obligations or neither obligation. *Id.*

For example, when two parties agree to perform a trade, in certain contexts there may be a delay between the time that the parties enter a contractual agreement obligating themselves to the trade and the time of settlement when the agreed trade is actually executed. Ordinarily, the parties would consummate the trade by paying or exchanging their mutual obligations after the intervening period, but in some cases one party might become unable to pay during that time and fail to notify the other before settlement. *Id.* As disclosed in Alice's patents, a trusted third party can be used to verify each party's ability to perform before actually exchanging either of the parties' agreed-upon obligations. *Id.*; *see also* '479 patent col. 5 ll. 61-63 ("The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement.").

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[1] While Chief Judge Rader is correct to note that no single opinion issued today commands a majority, seven of the ten members, a majority, of this en banc court have agreed that the method and computer-readable medium claims before us fail to recite patent-eligible subject matter. In addition, eight judges, a majority, have concluded that the particular method, medium, and system claims at issue in this case should rise or fall together in the § 101 analysis.

The claims currently before the court include claims 33 and 34 of the '479 patent and all claims of the '510, '720, and '375 patents. The relevant claims of the '479 and '510 patents recite methods of exchanging obligations between parties, the claims of the '720 patent are drawn to data processing systems, and the claims of the '375 patents claim data processing systems as well as computer-readable media containing a program code for directing an exchange of obligations.

II. District Court Proceedings

On May 24, 2007, CLS filed suit against Alice seeking a declaratory judgment of noninfringement, invalidity, and unenforceability as to the '479, '510, and '720 patents. Alice answered and counterclaimed, alleging infringement. By the agreement of the parties, the district court allowed limited initial discovery, addressing only the questions of (i) the operations of CLS, and (ii) CLS's relationship with the accused CLS system. *CLS Bank Int'l v. Alice Corp.*, No. 07-cv-00974 (D.D.C. Feb. 21, 2008), ECF No. 24 (Scheduling Order).

In March 2009, following limited discovery, CLS moved for summary judgment on the bases that any possible infringement could not be said to have occurred in the United States and that Alice's asserted claims were drawn to ineligible subject matter and therefore invalid under 35 U.S.C. § 101. Alice filed cross-motions on both issues. The district court denied CLS's motion as to extraterritoriality on October 13, 2009, finding that CLS's alleged infringing acts fell within the reach of domestic patent law. *CLS Bank Int'l v. Alice Corp.*, 667 F.Supp.2d 29, 33-38 (D.D.C.2009). Regarding subject-matter eligibility under § 101, the district court summarily denied the parties' motions on June 16, 2009, without prejudice to refiling, after the Supreme Court granted certiorari to review our decision in *In re Bilski*, 545 F.3d 943 (Fed.Cir.2008) (en banc), *cert. granted sub. nom. Bilski v. Doll*, — U.S. —, 129 S.Ct. 2735, 174 L.Ed.2d 246 (2009).

In the meantime, the '375 patent issued, and Alice filed amended counterclaims additionally asserting that CLS infringed each claim of the '375 patent. After the Supreme Court issued its decision in *Bilski v. Kappos*, — U.S. —, 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010), the parties renewed their crossmotions for summary judgment on the question of validity under § 101, with CLS adding invalidity contentions drawn to the newly issued '375 patent. Along with the parties' briefing, the district court also had before it (i) the asserted patents themselves, (ii) excerpts from the patents' prosecution histories, (iii) various guidelines issued by the United States Patent and Trademark Office ("PTO") regarding the application of § 101 during patent examination, and (iv) a declaration submitted by Alice's expert Paul Ginsberg. In particular, Mr. Ginsberg explained the operation of Alice's systems and methods, *see generally CLS Bank*, 768 F.Supp.2d at 224, and opined that a person of skill in the art reading the asserted patents would conclude that the claimed inventions must be implemented electronically using "some type of computing processor and memory." Ginsberg Decl., ECF No. 95-3, Ex. 1 ¶ 41.

The district court did not conduct claim construction before reaching the merits of the § 101 issue, but the parties agreed for purposes of deciding their summary judgment motions that Alice's claims should all be interpreted to require a computer including at least "a processor and memory." *CLS Bank*, 768 F.Supp.2d at 236; *see id.* at 235-36 ("The Court has yet to construe the terms of these claims. . . . [F]or purposes of these motions, CLS has agreed to assume a construction of terms favorable to Alice."). With the parties' assent, the district court assumed that all of the asserted claims required electronic implementation, noting consistent disclosures in the patents' specifications as well as the statements of Alice's expert, Mr. Ginsberg. *Id.* at 236.

With that understanding of the claims, the district court granted summary judgment in favor of CLS, holding each of the asserted claims of Alice's patents invalid under § 101. The district court concluded that Alice's method claims "are directed to an abstract idea of employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk." *Id.* at 243. Further, the district court held the asserted system claims similarly ineligible, as those claims "would preempt the use of the abstract concept of employing a neutral intermediary to facilitate simultaneous exchange of obligations in order to minimize risk on any computer, which is, as a practical matter, how these processes are likely to be applied." *Id.* at 252. The asserted media claims failed on the same ground as "directed to the same abstract concept despite the fact they nominally recite a different category of invention." *Id.* at 255.

Accordingly, the district court entered final judgment in favor of CLS, and Alice timely appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

I. Standard of Review

We review the grant or denial of summary judgment applying the law of the relevant regional circuit. *Teva Pharm. Indus. v. AstraZeneca Pharm. LP*, 661 F.3d 1378, 1381 (Fed.Cir.2011). The D.C. Circuit considers a district court's grant of summary judgment without deference. *Theodore Roosevelt Conservation P'ship v. Salazar*, 661 F.3d 66, 72 (D.C.Cir.2011). We apply our own law, however, with respect to issues of substantive patent law. *Aero Prods. Int'l, Inc. v. Intex Recreation Corp.*, 466 F.3d 1000, 1016 (Fed.Cir.2006). Patent eligibility under § 101 presents an issue of law that we review *de novo*. *Bancorp Servs., LLC v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1273 (Fed.Cir.2012).

II. Section 101

A. Statutory Subject Matter and Common Law Exceptions

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101 (2006). Short and unadorned, § 101 appears deceptively simple on its face, yet its proper application to computer-implemented inventions and in various other fields of technology has long vexed this and other courts.

The statute sets forth four broadly stated categories of patent-eligible subject matter: processes, machines, manufactures, and compositions of matter. As the Supreme Court has explained, Congress intended that the statutory categories would be broad and inclusive to best serve the patent system's constitutional objective of encouraging innovation. *See Diamond v. Chakrabarty*, 447 U.S. 303, 308-09, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980) ("In choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope."); ***Bilski***, 130 S.Ct. at 3225 ("Congress took this permissive approach to patent eligibility to ensure that 'ingenuity should receive a liberal encouragement.'" (quoting *Chakrabarty*, 447 U.S. at 308, 100 S.Ct. 2204)).

It is also important to recognize that § 101, while far-reaching, only addresses patent *eligibility*, not overall *patentability*. The statute directs that an invention that falls within one of its four enumerated categories "may" qualify for a patent; thus, inventions that are patent eligible are not necessarily patentable. As § 101 itself explains, the ultimate question of patentability turns on whether, in addition to presenting a patent-eligible invention, the inventor also satisfies "the conditions and requirements of this title," namely, the novelty, nonobviousness, and disclosure requirements of 35 U.S.C. §§ 102, 103, and 112, among others. *See* 35 U.S.C. § 101. Congress's broad approach to subject-matter eligibility ensures that the patent office doors remain open to most inventions, but even so, those that gain entry still must surmount various substantive and procedural hurdles that stand between patent eligibility and a valid patent. *See Diamond v. Diehr*, 450 U.S. 175, 191, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981).

While the categories of patent-eligible subject matter recited in § 101 are broad, their scope is limited by three important judicially created exceptions. "[L]aws of nature, natural phenomena, and abstract ideas" are excluded from patent eligibility, *id.* at 185, 101 S.Ct. 1048, because such fundamental discoveries represent "the basic tools of scientific and technological work," *Gottschalk v. Benson*, 409 U.S. 63, 67, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972). Thus, even inventions that fit within one or more of the statutory categories are not patent eligible if drawn to a law of nature, a natural phenomenon, or an abstract idea. The underlying concern is that patents covering such elemental concepts would reach too far and claim too much, on balance obstructing rather than catalyzing innovation. But danger also lies in applying the judicial exceptions too aggressively because "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, — U.S. —, 132 S.Ct. 1289, 1293, 182 L.Ed.2d 321 (2012). Taken too far, the exceptions could swallow patent law entirely.

Accordingly, the basic steps in a patent-eligibility analysis can be summarized as follows. We must first ask whether the claimed invention is a process, machine, manufacture, or composition of matter. If not, the claim is ineligible under § 101. If the invention falls within one of the statutory categories, we must then determine whether any of the three judicial exceptions nonetheless bars such a claim—is the claim drawn to a patent-ineligible law of nature, natural phenomenon, or abstract idea? If so, the claim is not patent eligible. Only claims that pass both inquiries satisfy § 101.

While simple enough to state, the patent-eligibility test has proven quite difficult to apply. The difficulty lies in consistently and predictably differentiating between, on the one hand, claims that would tie up laws of nature, natural phenomena, or abstract ideas, and, on the other, claims that merely "embody, use, reflect, rest upon, or apply" those fundamental tools. *Mayo*, 132 S.Ct. at 1293. For example, deciding whether or not a particular claim is abstract can feel subjective and unsystematic, and the debate often trends toward the metaphysical, littered with unhelpful analogies and generalizations. What is needed is a consistent, cohesive, and accessible approach to the § 101 analysis—a framework that will provide guidance and predictability for patent applicants and examiners, litigants, and the courts. As set forth below, the Supreme Court's foundational § 101 jurisprudence offers the guideposts to such a system, one that turns primarily on the practical likelihood of a claim preempting a fundamental concept. We would adopt this approach to address the abstractness of the specific computer-implemented inventions presented in this case, but it might also inform patent-eligibility inquiries arising in other contexts.

B. Foundational Section 101 Precedents

1. *Gottschalk v. Benson*

In *Benson*, the Supreme Court considered claims to computer-implemented methods "for converting binary-coded decimal (BCD) numerals into pure binary numerals." 409 U.S. at 64, 93 S.Ct. 253. The claims each recited a series of data manipulation steps for effecting the indicated numerical conversion and "purported to cover any use of the claimed method in a general-purpose digital computer of any type." *Id.*

Analyzing the claimed processes in view of its historical precedents, the Supreme Court concluded that the abstract ideas exception to patent eligibility applied. The Court identified the particular abstraction at issue as the freestanding "algorithm" or "generalized formulation" for performing BCD to pure binary conversion. *Id.* at 65, 93 S.Ct. 253. Next, the Court measured the scope of the claims against the scope of that overarching abstract idea. In practice, the claims were "so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion" and would thus reach every application of the basic conversion algorithm, in contrast to earlier cases concerning patent-eligible process claims that had been cabined to discrete applications "sufficiently definite to confine the patent monopoly within rather definite bounds." *Id.* at 68-69, 93 S.Ct. 253. Furthermore, even though the claims required a computer,[2] the Court did not view that as a meaningful limitation: "The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." *Id.* at 71-72, 93 S.Ct. 253. Accordingly, the claims were held ineligible for patenting under § 101.

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[2] Claim 8 required a computer on its face, but the literal terms of claim 13 were not so limited. *See Benson*, 409 U.S. at 73-74, 93 S.Ct. 253. The CCPA, however, had interpreted both claims as requiring a computer and had upheld them on that basis, *see In*

2. *Parker v. Flook*

Six years later, in *Parker v. Flook*, 437 U.S. 584, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978), the Supreme Court again considered the patent eligibility of a computerized process—in particular, a method for updating alarm limits for continuously monitored industrial process variables (*e.g.*, temperature or pressure) according to a disclosed mathematical formula. *See id.* at 585-86, 98 S.Ct. 2522. The claim required three steps: measuring the present value of a process variable, using the mathematical formula to calculate a new alarm limit in view of the present value, and adjusting the previous alarm limit to the newly calculated limit. *Id.*; *see also id.* at 596-97, 98 S.Ct. 2522 (claim 1). A further preamble limitation restricted the claim to processes "comprising the catalytic chemical conversion of hydrocarbons," *id.* at 596, 98 S.Ct. 2522, so the claim did not cover "every conceivable application of the formula," *id.* at 586, 98 S.Ct. 2522.

Although the claim would not "wholly preempt" the mathematical formula, *id.* at 589, 98 S.Ct. 2522, the

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re Benson, 58 CCPA 1134, 441 F.2d 682, 687-88 (1971), and the Supreme Court appeared to adopt that assumption.

Court nonetheless held that the claimed process fell under the abstract ideas exception to patent eligibility. In its analysis, the Court viewed the formula as an abstract principle and stated that the case must "be considered as if the principle or mathematical formula were well known." *Id.* at 592, 98 S.Ct. 2522. The Court then asked whether, to confer patent eligibility, the claim contained sufficient substance beyond the abstract mathematical formula itself—that is, "some other inventive concept in its application." *Id.* at 594, 98 S.Ct. 2522; *see also id.* at 590, 98 S.Ct. 2522 ("A competent draftsman could attach some form of post-solution activity to almost any mathematical formula. . . ."). Concluding that the field-of-use, monitoring, adjusting, and computer limitations were trivial or "well known" under such an analysis, the Court held that the claims were not patent eligible: "[I]f a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory." *Id.* at 594-95, 98 S.Ct. 2522 (quoting In re Richman, 563 F.2d 1026, 1030 (CCPA 1977)).

3. *Diamond v. Diehr*

The claims at issue in *Diehr* were drawn to processes for curing synthetic rubber that included "the use of a mathematical formula and a programmed digital computer." 450 U.S. at 177, 101 S.Ct. 1048. The claimed methods included steps for operating a rubber molding press that included constantly determining the temperature inside the mold, repetitively calculating the necessary cure time using a mathematical formula known as the Arrhenius equation, and opening the press whenever the elapsed cure time equaled the calculated necessary cure time. *See id.* at 179 n. 5, 101 S.Ct. 1048.

The Supreme Court held the claims to be patent eligible, a conclusion that was "not altered by the fact that in several steps of the process a mathematical equation and a programmed digital computer are used." *Id.* at 185, 101 S.Ct. 1048. In contrast to *Benson* and *Flook*, the claims in *Diehr* employed a mathematical concept but did "not seek to preempt the use of that equation. Rather, they [sought] only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process." *Id.* at 187, 101 S.Ct. 1048. In particular, the Court distinguished *Flook* on the basis that the claim there provided no substantive details regarding the method's actual performance—rather, "'[a]ll that it provides is a formula for computing an updated alarm limit.'" *See id.* at 186-87, 101 S.Ct. 1048 (quoting *Flook*, 437 U.S. at 586, 98 S.Ct. 2522). In contrast, in *Diehr*, the claimed process incorporating the Arrhenius equation also called for steps including "constantly measuring the actual temperature inside the mold," a step that was said to be new in the art. *See id.* at 178-79, 101 S.Ct. 1048.

The Court also explained that a claim "does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer" because "an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* at 187, 101 S.Ct. 1048. Because the applicant claimed a specific application, rather than an abstract idea in isolation, the claims satisfied § 101.

4. *Bilski v. Kappos*

Bilski concerned claims to processes for participants in energy commodities markets to hedge against the risk of price changes in those commodities. The claims recited the hedging strategy as a series of steps involving transactions between a commodity provider and commodity consumers and between the commodity provider and other market participants "having a counter-risk position" to the consumers in order to balance risk; other claims articulated the hedging strategy as "a simple mathematical formula." 130 S.Ct. at 3223-24. The claims did not require a computer.

Applying *Benson*, *Flook*, and *Diehr*, the Supreme Court held that the claims failed to recite a patent-eligible process because they covered the abstract idea of hedging against risk. "Allowing [the claims] would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea." *Id.* at 3231. In addition, the Court reiterated *Flook*'s admonition that such claims cannot be made patent eligible by "limiting an abstract idea to one field of use or adding token postsolution components." *Id.* The Court therefore affirmed the rejection of the claims at issue under § 101.

5. *Mayo v. Prometheus*

The Supreme Court's most recent guidance regarding patent eligibility drew heavily on the foregoing precedents in applying the "laws of nature" exception to claims covering medical diagnostic methods. The claims in *Mayo* recited methods for optimizing thiopurine administration in a patient based on a natural correlation between the therapeutic efficacy of a particular dose of a thiopurine and the resulting concentration of thiopurine metabolites in the patient's blood. Too little metabolite and the dose was insufficient; too much suggested that the dose should be reduced to avoid toxicity. *Mayo*, 132 S.Ct. at 1294-95. Accordingly, the claims recited the specific steps of administering the thiopurine drug and determining the resulting metabolite concentration in the patient's blood, wherein a concentration above or below predefined thresholds indicated a need to adjust the drug dose. *See id.* at 1295 (claim 1).

The Supreme Court held that those claims failed the § 101 test for subject-matter eligibility. The Court began its analysis by noting that the claims "set forth laws of nature—namely, relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm." *Id.* at 1296. Therefore, the question was "whether the claims do significantly more than simply describe these natural relations"; did they "add *enough*" to the natural law to render the claimed processes patent eligible? *Id.* at 1297. Examining the other limitations, the Court concluded that the "administering" and "determining" steps were insufficiently limiting or inventive to confer patent eligibility: "Anyone who wants to make use of these [natural] laws must first administer a thiopurine drug and measure the resulting metabolite concentrations, and so the combination amounts to nothing significantly more than an instruction to doctors to apply the applicable laws when treating their patients." *Id.* at 1298. Because these additional steps were mere "routine, conventional activity previously engaged in by scientists who work in the field," the Court concluded that they did not transform the law of nature into a patent-eligible application of that law. *Id.*

C. An Integrated Approach to § 101

Several common themes that run through the Supreme Court's decisions should frame our analysis in this and other § 101 cases.

First and foremost is an abiding concern that patents should not be allowed to preempt the fundamental tools of discovery—those must remain "free to all . . . and reserved exclusively to none." *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130, 68 S.Ct. 440, 92 L.Ed. 588 (1948). Preemption features prominently in the Supreme Court's recent § 101 decisions, *see Mayo*, 132 S.Ct. at 1301 ("The Court has repeatedly emphasized . . . a concern that patent law not inhibit further discovery by improperly tying up the future use of laws of nature."); *Bilski*, 130 S.Ct. at 3231 (concluding that the disputed claims "would preempt [risk hedging] in all fields, and would effectively grant a monopoly over an abstract idea"); *Diehr*, 450 U.S. at 187, 101 S.Ct. 1048 ("Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation."); *Benson*, 409 U.S. at 72, 93 S.Ct. 253 ("[I]f the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself."), and traces back to the earliest judicial decisions addressing subject-matter eligibility, *see, e.g., O'Reilly v. Morse*, 56 U.S. 62, 113, 15 How. 62, 14 L.Ed. 601 (1853) (rejecting a claim that would have broadly conferred "a monopoly" in the use of electromagnetism, "however developed, for the purpose of printing at a distance"). Guarding against the wholesale preemption of fundamental principles should be our primary aim in applying the common law exceptions to § 101.

To be clear, the proper focus is not preemption *per se*, for some measure of preemption is intrinsic in the statutory right granted with every patent to exclude competitors, for a limited time, from practicing the claimed invention. *See* 35 U.S.C. § 154. Rather, the animating concern is that claims should not be coextensive with a natural law, natural phenomenon, or abstract idea; a patent-eligible claim must include one or more substantive limitations that, in the words of the Supreme Court, add "significantly more" to the basic principle, with the result that the claim covers significantly *less*. *See Mayo* 132 S.Ct. at 1294. Thus, broad claims do not necessarily raise § 101 preemption concerns, and seemingly narrower claims are not necessarily exempt. What matters is whether a claim threatens to subsume the full scope of a fundamental concept, and when those concerns arise, we must look for meaningful limitations that prevent the claim as a whole from covering the concept's every practical application. *See id.* at 1302 ("The laws of nature at issue here are narrow laws that may have limited applications, but the patent claims that embody them nonetheless implicate this concern.").

Next, the cases repeatedly caution against overly formalistic approaches to subject-matter eligibility that invite manipulation by patent applicants. Allowing the determination of patent eligibility to "depend simply on the draftsman's art . . . would ill serve the principles underlying the prohibition against patents for 'ideas' or phenomena of nature." ***Flook***, 437 U.S. at 593, 98 S.Ct. 2522. Thus, claim drafting strategies that attempt to circumvent the basic exceptions to § 101 using, for example, highly stylized language, hollow field-of-use limitations, or the recitation of token post-solution activity should not be credited. *See Bilski*, 130 S.Ct. at 3230 ("[T]he prohibition against patenting abstract ideas 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment' or adding 'insignificant postsolution activity.'" (quoting *Diehr*, 450 U.S. at 191-92, 101 S.Ct. 1048)); ***Flook***, 437 U.S. at 590, 98 S.Ct. 2522 (rejecting such an approach as "exalt[ing] form over substance"). The Supreme Court's precedents require that we look past such devices when analyzing a claim to consider its true practical effect with respect to the purpose of § 101—preserving the "basic tools" of scientific discovery for common use.

Finally, the cases urge a flexible, claim-by-claim approach to subject-matter eligibility that avoids rigid line drawing. Bright-line rules may be simple to apply, but they are often impractical and counterproductive when applied to § 101. Such rules risk becoming outdated in the face of continual advances in technology—they risk "freez[ing] process patents to old technologies, leaving no room for the revelations of the new, onrushing technology." *Benson*, 409 U.S. at 71, 93 S.Ct. 253. Stringent eligibility formulas may also lead to misplaced focus, requiring courts to "pose questions of such intricacy and refinement that they risk obscuring the larger object of securing patents for valuable inventions without transgressing the public domain." *Bilski*, 130 S.Ct. at 3227. Accordingly, the Supreme Court has rejected calls for a categorical exclusion of so-called business method claims and has held that the formulaic "machine-or-transformation" test cannot be the exclusive means for determining the patent eligibility of process claims. *Id.* at 3227-29. What is needed is a flexible, pragmatic approach that can adapt and account for unanticipated technological advances while remaining true to the core principles underlying the fundamental exceptions to § 101.

With these basic principles in mind, the following analysis should apply in determining whether a computer-implemented claim recites patent-eligible subject matter under § 101 or falls into the common law exception for abstract ideas.

The first question is whether the claimed invention fits within one of the four statutory classes set out in § 101. Assuming that condition is met, the analysis turns to the judicial exceptions to subject-matter eligibility. A preliminary question in applying the exceptions to such claims is whether the claim raises § 101 abstractness concerns at all. Does the claim pose any risk of preempting an abstract idea? In most cases, the answer plainly will be no. *Cf. Honeywell Inc. v. Sperry Rand Corp.*, No. 4-67-cv-138, 180 USPQ 673, 1973 WL 903 (D.Minn. Oct. 19, 1973) (early computer hardware patents).

Where bona fide § 101 concerns arise, however, it is important at the outset to identify and define whatever fundamental concept appears wrapped up in the claim so that the subsequent analytical steps can proceed on a consistent footing. Section 101 is concerned as much with preserving narrow "basic tools" as it is with abstract concepts that have far-reaching implications—for example, risk hedging or transmitting information at a distance using electricity—and the breadth of acceptable exclusion may vary accordingly. *See Mayo*, 132 S.Ct. at 1302-03. In short, one cannot meaningfully evaluate whether a claim preempts an abstract idea until the idea supposedly at risk of preemption has been unambiguously identified. Although not required, conducting a claim construction analysis before addressing § 101 may be especially helpful in this regard by facilitating a full understanding of what each claim entails. *See Bancorp*, 687 F.3d at 1273-74.

The § 101 inquiry next proceeds to the requisite preemption analysis. With the pertinent abstract idea identified, the balance of the claim can be evaluated to determine whether it contains additional substantive limitations that narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself. *See Mayo*, 132 S.Ct. at 1300 (discussing a patent-eligible process claim that involved a law of nature but included additional steps "that confined the claims to a particular, useful application of the principle"); *Bilski*, 130 S.Ct. at 3231 (rejecting claims that "add [too little] to the underlying abstract principle"); *Diehr*, 450 U.S. at 187, 101 S.Ct. 1048 ("[T]hey do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.").

The requirement for substantive claim limitations beyond the mere recitation of a disembodied fundamental concept has "sometimes" been referred to as an "inventive concept." *See Mayo*, 132 S.Ct. at 1294 (citing *Flook*, 437 U.S. at 594, 98 S.Ct. 2522). We do not read the Court's occasional use of that language in the § 101 context as imposing a requirement that such limitations must necessarily exhibit "inventiveness" in the same sense as that term more commonly applies to two of the statutory requirements for patentability, *i.e.*, novelty and nonobviousness. *See* 35 U.S.C. §§ 102, 103. The phrase "inventive concept" originated with *Flook*, yet the Court began its discussion of § 101 in that case by stating that the question of patent-eligible subject matter "does not involve the familiar issues of novelty and obviousness that routinely arise under §§ 102 and 103." 437 U.S. at 588, 98 S.Ct. 2522. The Court has since reiterated that those separate inquiries do not bear on the question of subject-matter eligibility under § 101. *Diehr*, 450 U.S. at 188-89, 101 S.Ct. 1048 ("The 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter."); *id.* at 191, 101 S.Ct. 1048 ("A rejection on either of these [anticipation or obviousness] grounds does not affect the determination that respondents' claims recited subject matter which was eligible for patent protection under § 101."); *see also Mayo*, 132 S.Ct. at 1298-1300, 1302 (holding was consistent with *Diehr* and *Flook* and did not "depart from case law precedent").

An "inventive concept" in the § 101 context refers to a genuine human contribution to the claimed subject matter. "The underlying notion is that a scientific principle . . . reveals a relationship that has always existed." *Flook*, 437 U.S. at 593 n. 15, 98 S.Ct. 2522. From that perspective, a person cannot truly "invent" an abstract idea or scientific truth. He or she can discover it, but not invent it. Accordingly, an "inventive concept" under § 101—in contrast to whatever fundamental concept is also represented in the claim—must be "a product of human ingenuity." *See Chakrabarty*, 447 U.S. at 309, 100 S.Ct. 2204.

In addition, that human contribution must represent more than a trivial appendix to the underlying abstract idea. The § 101 preemption analysis centers on the practical, real-world effects of the claim. *See, e.g., Mayo*, 132 S.Ct. at 1294 ("[A] process that focuses upon the use of a natural law [must] also contain other elements . . . sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself."); *Bilski*, 130 S.Ct. at 3231 (rejecting claims that would "effectively grant a monopoly over an abstract idea"); *Benson*, 409 U.S. at 71-72, 93 S.Ct. 253 ("[T]he patent . . . in practical effect would be a patent on the algorithm itself."). Limitations that represent a human contribution but are merely tangential, routine, well-understood, or conventional, or in practice fail to narrow the claim relative to the fundamental principle therein, cannot confer patent eligibility.

For example, the "administering" and "determining" steps in *Mayo* might have appeared to be concrete limitations representing true human contributions to the claimed methods; it is difficult to see how giving a particular man-made drug to a patient or drawing and testing blood could be considered purely abstract or preordained. Yet the Court held that those steps failed to render the claims patent eligible because, as a practical matter, they were necessary to every practical use of what it found to be a natural law and therefore were not truly limiting. *Mayo*, 132 S.Ct. at 1298 ("Anyone who wants to make use of these laws must first administer a thiopurine drug and measure the resulting metabolite concentrations. . . ."); *see also Benson*, 409 U.S. at 71, 93 S.Ct. 253 (noting that the "mathematical formula involved here has no substantial practical application except in connection with a digital computer"). Also in *Mayo*, the Court instructed that the added steps, apart from the natural law itself, must amount to more than "well-understood, routine, conventional activity previously engaged in by researchers in the field." 132 S.Ct. at 1294. Similarly, token or trivial limitations, *see Diehr*, 450 U.S. at 191-92, 101 S.Ct. 1048 (stating that "insignificant post-solution activity will not transform an unpatentable principle into a patentable process"), or vague limitations cast in "highly general language," *Mayo*, 132 S.Ct. at 1302, have failed to satisfy § 101. Finally, bare field-of-use limitations cannot rescue a claim from patent ineligibility where the claim as written still effectively preempts all uses of a fundamental concept within the stated field. *Bilski*, 130

S.Ct. at 3230 (discussing *Flook* and *Diehr*). Whether a particular claim satisfies the § 101 standard will vary based on the balance of factors at play in each case, and the fact that there is no easy bright-line test simply emphasizes the need for the PTO and the courts to apply the flexible analysis above to the facts at hand.

Thus, the Supreme Court used the language "routine" and "conventional" in *Mayo* to indicate what qualities added to a natural law do not create patent-eligible subject matter. *See Mayo*, 132 S.Ct. at 1298. We do not therefore understand that language to be confused with novelty or nonobviousness analyses, which consider whether particular steps or physical components together constitute a new or nonobvious invention. Analyzing patent eligibility, in contrast, considers whether steps combined with a natural law or abstract idea are so insignificant, conventional, or routine as to yield a claim that effectively covers the natural law or abstract idea itself.

Two other considerations are worth noting with respect to the § 101 analysis. First, some have argued that because § 101 is a "threshold test," *Bilski*, 130 S.Ct. at 3225, district courts must always consider subject-matter eligibility first among all possible bases for finding invalidity. That is not correct. District courts are rightly entrusted with great discretion to control their dockets and the conduct of proceedings before them, including the order of issues presented during litigation. *See, e.g., Amado v. Microsoft Corp.*, 517 F.3d 1353, 1358 (Fed.Cir.2008) ("District courts . . . are afforded broad discretion to control and manage their dockets, including the authority to decide the order in which they hear and decide issues pending before them."). In addition, district courts may exercise their discretion to begin elsewhere when they perceive that another section of the Patent Act might provide a clearer and more expeditious path to resolving a dispute. *See MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1258-62 (Fed.Cir.2012); Dennis Crouch & Robert P. Merges, *Operating Efficiently Post-*Bilski *by Ordering Patent Doctrine Decision-Making*, 25 Berkeley Tech. L.J. 1673 (2010).

Second, it bears remembering that all issued patent claims receive a statutory presumption of validity. 35 U.S.C. § 282; *Microsoft Corp. v. i4i Ltd. P'ship*, — U.S. —, 131 S.Ct. 2238, 180 L.Ed.2d 131 (2011). And, as with obviousness and enablement, that presumption applies when § 101 is raised as a basis for invalidity in district court proceedings. *See* OSRAM *Sylvania, Inc. v. Am. Induction Techs., Inc.*, 701 F.3d 698, 706 (Fed.Cir.2012) (obviousness); *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195 (Fed.Cir.1999) (enablement).

Applying the above considerations to assess the patent eligibility of the specific computer-implemented claims at issue in this appeal, we conclude that the district court correctly held that the asserted claims drawn to methods, computer-readable media, and systems are not patent eligible and are hence invalid under § 101.

III. The Patents in Suit

In this case, Alice has asserted four patents against CLS. As described, the asserted patents share substantially the same specification and disclose and claim computerized methods, computer-readable media, and systems that are useful for conducting financial transactions using a third party to settle obligations between a first and second party so as to mitigate "settlement risk." Briefly, the asserted claims are as follows: claims 33 and 34 of the '479 patent recite methods; all claims of the '510 patent also recite methods; all claims of the '720 patent recite data processing systems; and the claims of the '375 patent recite either data processing systems (claims 1-38 and 42-47) or computer-readable storage media having a computer program stored therein (claims 39-41). CLS contends that the asserted claims fall into the abstract ideas exception to § 101 and are therefore invalid as directed to patent-ineligible subject matter.

A. Method Claims

Claim 33 of the '479 patent is representative of the asserted method claims:

> 33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:
>
> > (a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
> >
> > (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;
> >
> > (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than

> the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and
>
> (d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

'479 patent col. 65 ll. 23-50. The claim thus recites a method for facilitating a previously arranged exchange between two parties requiring the use of "shadow" records maintained by a third-party "supervisory institution." Briefly, the claimed process requires the supervisory institution to create shadow records for each party that mirror the parties' real-world accounts held at their respective "exchange institutions." At the start of each day, the supervisory institution updates its shadow records to reflect the value of the parties' respective accounts. Transactions are then referred to the supervisory institution for settlement throughout the day, and the supervisory institution responds to each in sequence by adjusting the shadow records and permitting only those transactions for which the parties' updated shadow records indicate sufficient resources to satisfy their mutual obligations. At the end of each day, the supervisory institution irrevocably instructs the exchange institutions to carry out the permitted transactions. Although claim 33 does not expressly recite any computer-based steps,[3] the parties have agreed that the recited shadow records and transactions require computer implementation. *CLS Bank*, 768 F.Supp.2d at 236.

Claim 33 plainly recites a process. The issue presented then becomes whether that process amounts to no more than a patent-ineligible abstract idea. As described, the first step in that analysis requires identifying the abstract idea represented in the claim. The methods claimed here draw on the abstract idea of reducing settlement risk by effecting trades through a third-party intermediary (here, the supervisory institution) empowered to verify that both parties can fulfill their obligations before allowing the exchange—*i.e.*, a form of escrow. CLS describes that concept as "fundamental and ancient," but the latter is not determinative of the question of abstractness. Even venerable concepts, such as risk hedging in commodity transactions, *see Bilski*, 130 S.Ct. at 3231, were once unfamiliar, just like the concepts inventors are unlocking at the leading edges of technology today. But whether long in use or just recognized, abstract ideas remain abstract. The concept of reducing settlement risk by facilitating a trade through third-party intermediation is an abstract idea because it is a "disembodied" concept, *In re Alappat*, 33 F.3d 1526, 1544 (Fed.Cir.1994) (en banc), a basic building block of human ingenuity, untethered from any real-world application. Standing alone, that abstract idea is not patent-eligible subject matter.

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[3] The method claims of the '510 patent state that the supervisory institution "electronically adjust[s]" the shadow records. *E.g.*, '510 patent col. 64 ll. 11-12.

The analysis therefore turns to whether the balance of the claim adds "significantly more." Apart from the idea of third-party intermediation, the claim's substantive limitations require creating shadow records, using a computer to adjust and maintain those shadow records, and reconciling shadow records and corresponding exchange institution accounts through end-of-day transactions. None of those limitations adds anything of substance to the claim.

First, the requirement for computer implementation could scarcely be introduced with less specificity; the claim lacks *any* express language to define the computer's participation. In a claimed method comprising an abstract idea, generic computer automation of one or more steps evinces little human contribution. There is no specific or limiting recitation of essential, *see SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1332-33 (Fed.Cir.2010), or improved computer technology, *see Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 865, 868-69 (Fed.Cir.2010), and no reason to view the computer limitation as anything but "insignificant postsolution activity" relative to the abstract idea, *see Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1323-24 (Fed.Cir.2012). Furthermore, simply appending generic computer functionality to lend speed or efficiency to the performance of an otherwise abstract concept does not meaningfully limit claim scope for purposes of patent eligibility. *Bancorp*, 687 F.3d at 1278; *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed.Cir.2012); *Fort Props.*, 671 F.3d at 1323-24. That is particularly apparent in this case. Because of the efficiency and ubiquity of computers, essentially all practical, real-world applications of the abstract idea implicated here would rely, at some level, on basic computer functions—for example, to quickly and reliably calculate balances or exchange data among financial institutions. At its most basic, a computer is just a calculator capable of performing mental steps faster than a human could. Unless the claims require a computer to perform operations that are not merely accelerated calculations, a computer does not itself confer patent eligibility. In short, the requirement for computer participation in these claims fails to supply an "inventive concept" that represents a nontrivial, nonconventional human contribution or materially narrows the claims relative to the abstract idea they embrace.

Nor does requiring the supervisory institution to create and adjust a "shadow credit record" and a "shadow debit record" narrow the claims from the realm of abstraction. With the term "shadow record," the claim uses extravagant language to recite a basic function required of any financial intermediary in an escrow arrangement—tracking each party's obligations and performance. Viewed properly as reciting no more than the necessary tracking activities of a supervisory institution, the steps relating to creating a "shadow record" and then obtaining and adjusting its balance are insignificant "'[pre]-solution activity,'" *Mayo*, 132 S.Ct. at 1298 (alteration in original) (quoting *Flook*, 437 U.S. at 590, 98 S.Ct. 2522), and ancillary "data-gathering steps," *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1370 (Fed.Cir.2011), and therefore add nothing of practical significance to the underlying idea of reducing settlement risk through intermediation.

Finally, providing end-of-day instructions to the exchange institutions to reconcile the parties' real-world accounts with the day's accumulated adjustments to their shadow records is a similarly trivial limitation that does not distinguish the claimed method. According to the claim, each permitted transaction during the day prompts corresponding shadow record adjustments, which the exchange institutions must honor as "irrevocable" payment obligations. *E.g.*, '479 patent col. 65 ll. 36-50. Whether the instructions are issued in real time, every two hours, or at the end of every day, there is no indication in the record that the precise moment chosen to execute those payments makes any significant difference in the ultimate application of the abstract idea.

In sum, there is nothing in the asserted method claims that represents "significantly more" than the underlying abstract idea for purposes of § 101. But for the implied requirement for computer implementation, the broad, non-technical method claims presented here closely resemble those in *Bilski*, which also explained a "basic concept of . . . protecting against risk." 130 S.Ct. at 3231. And, as described, adding generic computer functions to facilitate performance provides no substantial limitation and therefore is not "enough" to satisfy § 101. As in *Bilski*, upholding Alice's claims to methods of financial intermediation "would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea." *Id.* Consequently, the method claims are drawn to patent-ineligible subject matter and invalid under § 101.

We note that, while other opinions of judges in this case use different language and reasoning, two other judges, in addition to those joining this opinion, join in the result of patent ineligibility as to Alice's asserted method claims.

B. Computer-Readable Medium Claims

Claims 39-41 of the '375 patent are so-called "*Beauregard* claims," named for *In re Beauregard*, 53 F.3d 1583 (Fed.Cir.1995). Claims in *Beauregard* format formally recite a tangible article of manufacture—a computer-readable medium, such as a computer disk or other data storage device—but such claims also require the device to contain a computer program for directing a computer to carry out a specified process. Claim 39 of the '375 patent reads:

> 39. A computer program product comprising *a computer readable storage medium having computer readable program code embodied in the medium* for use by a party to exchange an obligation between a first party and a second party, the computer program product comprising:
>
> > program code for causing a computer to send a transaction from said first party relating to an exchange obligation arising from a currency exchange transaction between said first party and said second party; and
> >
> > program code for causing a computer to allow viewing of information relating to processing, by a supervisory institution, of said exchange obligation, wherein said processing includes (1) maintaining information about a first account for the first party, independent from a second account maintained by a first exchange institution, and information about a third account for the second party, independent from a fourth account maintained by a second exchange institution; (2) electronically adjusting said first account and said third account, in order to effect an exchange obligation arising

> from said transaction between said first party and said second party, after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and (3) generating an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

'375 patent col. 68 ll. 5-35 (emphasis added).

Claim 39 thus nominally recites as its subject matter a physical device—a "computer readable storage medium" that would fall into a § 101 category separate from the methods discussed above and would at first blush seem less susceptible to abstractness concerns. But under § 101 we must look past drafting formalities and let the true substance of the claim guide our analysis. Here, although the claim's preamble appears to invoke a physical object, the claim term "computer readable storage medium" is stated in broad and functional terms—incidental to the claim—and every substantive limitation presented in the body of the claim (as well as in dependent claims 40 and 41) pertains to the method steps of the program code "embodied in the medium." Therefore, claim 39 is not "truly drawn to a specific computer readable medium, rather than to the underlying method" of reducing settlement risk using a third-party intermediary. *CyberSource*, 654 F.3d at 1374-75 (internal quotation marks omitted). Despite their *Beauregard* format, Alice's "computer readable medium claims" are thus equivalent to the methods they recite for § 101 purposes. In other words, they are merely method claims in the guise of a device and thus do not overcome the Supreme Court's warning to avoid permitting a "competent draftsman" to endow abstract claims with patent-eligible status.

Of course, all claims are normally to be considered separately, but discrete claims reciting subject matter only nominally from different statutory classes may warrant similar substantive treatment under § 101 when, in practical effect, they cover the same invention. That may be particularly apparent where, as here, a claim presents a physical recitation of an abstract method, and parallel claims from the same patent family claim that same abstract method in the same or similar terms. So considered, claims 39-41 of the '375 patent fail the patent-eligibility test for the same reasons as the cognate method claims discussed above. The "program code" of claim 39 "caus[es] a computer" to perform a method of escrow that is indistinguishable from that recited in claim 33 of the '479 patent, and no less abstract. Accordingly, claims 39-41 of the '375 patent are invalid under § 101. As with the method claims, two other judges of this court, in addition to those joining this opinion, similarly conclude that the computer-readable medium claims are not patent eligible.

C. System Claims

The remaining claims in this appeal recite "data processing systems" configured to enable the exchange of mutual obligations through an intermediary—in these claims, the computer system itself. Before addressing these claims in particular, we again note that our colleagues on the court, other than those joining this opinion, have agreed that, at least in this case, the method, medium, and system claims should be considered together for purposes of § 101. Three other judges on this court—for a total of eight—have so concluded.

Claim 1 of the '720 patent is representative of the contested system claims:

> 1. A data processing system to enable the exchange of an obligation between parties, the system comprising:
>
> > *a data storage unit* having stored therein information about a shadow credit record and shadow debit record for a party, independent from a credit record and debit record maintained by an exchange institution; and
> >
> > *a computer*, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said shadow credit record and/or said shadow debit record in order to effect an exchange obligation arising from said transaction, allowing only those transactions that do not result in a value of said shadow debit record being less than a value of said shadow credit record; and (c) generate an instruction to said exchange institution at the end of a period of time to adjust said credit record and/or said debit record in accordance with the adjustment of said shadow credit record and/or said shadow debit record, wherein said instruction being an irrevocable, time invariant obligation placed on said exchange institution.

'720 patent col. 65 ll. 42-61 (emphases added). As is apparent, the claim recites a computerized system configured to carry out a series of steps that mirror Alice's method claims—maintaining shadow records, allowing only those transactions supported by adequate value in the shadow records, adjusting the shadow records pursuant to such transactions, and later instructing exchange institutions to execute the allowed transactions. Indeed, Alice's method and system claims use similar and often identical language to describe those actions. *Compare id*. col. 65 ll. 44-61, *with* '479 patent col. 65 ll. 28-50. The system claims are different, however, in that they also recite tangible devices as system components, including at least "a computer" and "a data storage unit." Other claims specify additional components, such as a "first party device" and a "communications controller." *See, e.g.*, '375 patent col. 66 ll. 65-66. Similar to the computer readable medium claims, the system claims are formally drawn to physical objects and therefore raise a question whether they deserve to be evaluated differently under the abstract ideas exception from the accompanying method claims discussed above. Careful analysis shows that they do not.

For some system claims, the abstract ideas exception may indeed be plainly inapplicable, and such claims will face little difficulty passing through the § 101 filter. But applying a presumptively different approach to system claims generally would reward precisely the type of clever claim drafting that the Supreme Court has repeatedly instructed us to ignore. As illustrated by the obvious parallels between the method and system claims now before us, it is often a straightforward exercise to translate a method claim into system form, and vice versa. That much has long been recognized. *See In re Johnston*, 502 F.2d 765, 773 (CCPA 1974) (Rich, J., dissenting) (noting that "[e]very competent draftsman" knows how to cast method claims "in machine system form"). Thus, when § 101 issues arise, the same analysis should apply regardless of claim format: Does the claim, in practical effect, place an abstract idea at risk of preemption? And, if so, do the limitations of the claim, including any computer-based limitations, add "enough" beyond the abstract idea itself to limit the claim to a narrower, patent-eligible application of that idea? Or, is it merely a Trojan horse designed to enable abstract claims to slide through the screen of patent eligibility?

The computer-based limitations recited in the system claims here cannot support any meaningful distinction from the computer-based limitations that failed to supply an "inventive concept" to the related method claims. The shadow record and transaction limitations in Alice's method claims require "a computer," *CLS Bank*, 768 F.Supp.2d at 236, evidently capable of calculation, storage, and data exchange. The system claims are little different. They set forth the same steps for performing third-party intermediation and provide for computer implementation at an incrementally reduced, though still striking level of generality. Instead of wholly implied computer limitations, the system claims recite a handful of computer components in generic, functional terms that would encompass any device capable of performing the same ubiquitous calculation, storage, and connectivity functions required by the method claims.

For example, method claim 33 of the '479 patent requires "creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions." '479 patent col. 65 ll. 28-31. In system claim 26 of the '375 patent, which is among the system claims that recite the most computer hardware, "a data storage unit" performs the analogous function. That claim recites "a data storage unit having stored therein (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution." '375 patent col. 67 ll. 1-7.

Likewise, other steps of method claim 33 include (i) "for every transaction . . . adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time," and (ii) "instructing ones of the exchange institutions to exchange credits or debits . . . in accordance with the adjustments of the said permitted transactions." '479 patent col. 65 ll. 36-48. Similarly, system claim 26 recites:

> [A] computer, coupled to said data storage unit and said communications controller, that is configured to (a) receive a transaction from said first party device via said communications controller; (b) electronically adjust said first account and said third account . . . after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and (c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account. . . .

'375 patent col. 67 ll. 8-23.

Despite minor differences in terminology, *e.g.*, first and third "independent" accounts instead of "shadow" records, the asserted method and system claims require performance of the same basic process. Although the system claims associate certain computer components with some of the method steps, none of the recited hardware offers a meaningful limitation beyond generally linking "the use of the [method] to a particular technological environment," that is, implementation via computers. *Bilski*, 130 S.Ct. at 3230 (quoting *Diehr*, 450 U.S. at 191, 101 S.Ct. 1048) (internal quotation marks omitted); *see Mayo*, 132 S.Ct. at 1301 ("[The Court in *Benson*] held that simply implementing a mathematical principle on a physical machine, namely a computer, was not a patentable application of that principle."). For all practical purposes, *every* general-purpose computer will include "a computer," "a data storage unit," and "a communications controller" that would be capable of performing the same generalized functions required of the claimed systems to carry out the otherwise abstract methods recited therein.

Therefore, as with the asserted method claims,[4] such limitations are not actually limiting in the sense required under § 101; they provide no significant "inventive concept." The system claims are instead akin to stating the abstract idea of third-party intermediation and adding the words: "apply it" on a computer. *See Mayo*, 132 S.Ct. at 1294. That is not sufficient for patent eligibility, and the system claims before us fail to define patent-eligible subject matter under § 101, just as do the method and computer-readable medium claims.

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[4] To be clear, the fact that one or more related method claims has failed under § 101, as here, does not dictate that all associated system claims or even all associated method claims must suffer the same fate. For example, a system claim that builds on the same abstract idea as a patent-ineligible method may well incorporate sufficient additional limitations, computer-based or otherwise, to transform that idea into a patent-eligible application. But that is not the case here.

One of the separate opinions in this case, concurring in part in the judgment, takes aim at this opinion, asserting that the system claims here are simply claims to a patent-eligible machine, a tangible item one can put on one's desk. Machines are unquestionably eligible for patenting, states the opinion, although the system claims here clearly track the method claims that the separate opinion concedes are not patent eligible.

That conclusion is surely correct as an abstract proposition. A particular computer system, composed of wires, plastic, and silicon, is no doubt a tangible machine. But that is not the question. The question we must consider is whether a *patent claim* that ostensibly describes such a system on its face represents something more than an abstract idea in legal substance. Claims to computers were, and still are, eligible for patent. No question should have arisen concerning the eligibility of claims to basic computer hardware under § 101 when such devices were first invented. But we are living and judging now (or at least as of the patents' priority dates), and have before us not the patent eligibility of specific types of computers or computer components, but computers that have routinely been adapted by software consisting of abstract ideas, and claimed as such, to do all sorts of tasks that formerly were performed by humans. And the Supreme Court has told us that, while avoiding confusion between § 101 and §§ 102 and

103, merely adding existing computer technology to abstract ideas—mental steps—does not as a matter of substance convert an abstract idea into a machine.

That is what we face when we have a series of claims to abstract methods and computers fitted to carry out those methods. We are not here faced with a computer *per se*. Such are surely patent-eligible machines. We are faced with abstract methods coupled with computers adapted to perform those methods. And that is the fallacy of relying on *Alappat*, as the concurrence in part does. Not only has the world of technology changed, but the legal world has changed. The Supreme Court has spoken since *Alappat* on the question of patent eligibility, and we must take note of that change. Abstract methods do not become patent-eligible machines by being clothed in computer language.

CONCLUSION

As described, we agree with the district court and conclude that the asserted method, computer-readable medium, and system claims of Alice's '479, '510, '720, and '375 patents are invalid under § 101 for failure to recite patent-eligible subject matter.

Concurring-in-part and dissenting-in-part opinion filed by RADER, Chief Judge, LINN, MOORE, and O'MALLEY, Circuit Judges, as to all but part VI of that opinion. RADER, Chief Judge, and MOORE, Circuit Judge, as to part VI of that opinion.

RADER, Chief Judge, LINN, MOORE, and O'MALLEY, Circuit Judges, as to all but part VI, concurring-in-part and dissenting-in-part. RADER, Chief Judge, and MOORE, Circuit Judge, as to part VI.[1]

This court again addresses questions regarding patent eligible subject matter. After consideration of the Patent Act and case law precedents, we would reverse the district court's holding that the asserted system claims are not patent eligible. Chief Judge Rader and Judge Moore would, however, affirm the district court's conclusion that the asserted method and media claims are not eligible for patenting. Judges Linn and O'Malley write separately as to these latter claims. Accordingly, we would remand for additional proceedings consistent with this opinion.

I

Alice Corporation (Alice) owns U.S. Patent Nos. 5,970,479 (the '479 Patent), 6,912,510 (the '510 Patent), 7,149,720 (the '720 Patent), and 7,725,375 (the '375 Patent). Generally, these patents relate to methods and a computerized system for exchanging obligations in which a trusted third party settles obligations between a first and second party in order to eliminate "settlement risk." Settlement risk is the risk that only one party will meet its payment obligation. In simple terms, the invention eliminates this risk with a trusted third party that exchanges either both or neither party's obligation.

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[1] No portion of any opinion issued today other than our Per Curiam Judgment garners a majority. The court is evenly split on the patent eligibility of the system claims. Although a majority of the judges on the court agree that the method claims do not recite patent eligible subject matter, no majority of those judges agrees as to the legal rationale for that conclusion. Accordingly, though much is published today discussing the proper approach to the patent eligibility inquiry, nothing said today beyond our judgment has the weight of precedent.

Alice's expert testified by declaration that "[w]hen obligations arise from a trade made between two parties, *e.g.*, a trade of stock or a trade of foreign currency, typically, there is a gap in time between when the obligation arises and when the trade is 'settled.'" Alice Corp. Pty. Ltd.'s Renewed Cross-Motion for Partial Summary Judgment as to Subject Matter Eligibility, Declaration of Stanley E. Fisher, Exhibit 1, Declaration of Paul Ginsberg at ¶ 21, *CLS Bank Int'l v. Alice Corp.*, 768 F.Supp.2d 221 (D.D.C.2011) (No. 1:07-cv-974), ECF No. 95-3 (Ginsberg Decl.) "In a number of financial contexts, the process of exchanging obligations, or settlement, is separate from the process of entering into a contract to perform a trade." *Id.* For example, if two banks want to exchange currency, they would agree to make a transaction but would postpone the actual exchange until confirmation of the price—typically two days later. After that, both banks would "settle" the trade by paying their predetermined amounts to each other. But the time delay presents a risk that one bank would, at settlement time, no longer have sufficient funds to satisfy its obligations.

The asserted patent claims—claims 33 and 34 of the '479 Patent, and all claims of the '510, '720, and '375 Patents—seek to minimize this risk. The relevant claims of the '479 and '510 Patents are method claims. The claims of the '720 and '375 Patents are system and product (media) claims.

In May 2007, CLS Bank International and CLS Services Ltd. (collectively, CLS Bank) sued Alice, seeking a declaration that the asserted claims are invalid, unenforceable, or otherwise not infringed. In

August 2007, Alice counterclaimed, alleging that CLS Bank infringed claims 33 and 34 of the '479 Patent, and all claims of the '510 and '720 Patents. The U.S. filing dates of the patents range from 1993 to 2005, with claims to priority going back even earlier.

The parties filed cross-motions for summary judgment on whether the asserted claims were eligible subject matter under Section 101. In May 2010, the '375 Patent issued to Alice, and Alice soon filed amended counterclaims asserting that CLS Bank also infringed all of its claims. After the Supreme Court decided *Bilski v. Kappos*, — U.S. —, 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010) (*Bilski*), the parties renewed their cross-motions for summary judgment, with CLS Bank asserting that the newly-added '375 Patent also did not claim eligible subject matter under Section 101.

The district court granted CLS Bank's motion for summary judgment and denied Alice's cross-motion. The district court held that no asserted claim contained patent eligible subject matter. *CLS Bank Int'l v. Alice Corp.*, 768 F.Supp.2d 221 (D.D.C.2011), *vacated*, 484 Fed.Appx. 559 (Fed.Cir.2012). Alice timely appealed, and this court has jurisdiction under 28 U.S.C. § 1295(a)(1). A panel of this court reversed. *CLS Bank Int'l v. Alice Corp.*, 685 F.3d 1341 (Fed.Cir.2012). CLS Bank filed a petition for rehearing en banc. In its order granting en banc reconsideration, this court invited the parties and others to address two questions:

> a. What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible "abstract idea"; and when, if ever, does the presence of a computer in a claim

> lend patent eligibility to an otherwise patent-ineligible idea?
>
> b. In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium; and should such claims at times be considered equivalent for § 101 purposes?

CLS Bank Int'l v. Alice Corp., 484 Fed.Appx. 559 (Fed.Cir.2012).

II

We begin with the text of the statute. *See Diamond v. Diehr*, 450 U.S. 175, 182, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981); *see also Bilski*, 130 S.Ct. at 3225; *In re Alappat*, 33 F.3d 1526, 1542 (Fed.Cir.1994) (en banc). Section 101 provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Section 100(b) further provides that the "term 'process' means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."

To understand these provisions in context, the Supreme Court has advised that the "new" requirement in Section 101 is now governed by Section 102. *Diehr*, 450 U.S. at 189, 101 S.Ct. 1048; *see* S.Rep. No. 82-1979, at 6 (1952) ("Section 102 . . . includes, in effect, an amplification and definition of 'new' in section 101.") (S.Rep.82-1979). Similarly, as shown below, whether a new process, machine, and so on is "inventive" is not an issue under Section 101; the condition for "more" than novelty is contained only in Section 103. Thus, so long as the "conditions and requirements" of patentability are met, a person who invents or discovers a useful process, or an improvement to one, may obtain a patent—and may do so even if the process includes only a new use of an old machine. *See Bilski*, 130 S.Ct. at 3225; *Alappat*, 33 F.3d at 1542.

Underscoring its breadth, Section 101 both uses expansive categories and modifies them with the word "any." In "choosing such expansive terms . . . modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope." *Bilski*, 130 S.Ct. at 3225 (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 308, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980) (some internal quotation marks omitted)).

Defining one of those expansive categories, Section 100(b) confirms the statute's intended breadth. At first examination, the Act's definition of "process" to include a new use of a known machine seems superfluous. After all, if "any" process may be patented under Section 101, Section 100(b) seems wholly unnecessary. An examination of the context for adding Section 100(b) informs the analysis of Section 101. Specifically, the 1952 amendments added Section 100(b) to ensure that doubts about the scope of a "process" under the pre-1952 version of the patent statute would not be read into the new Act. P.J. Federico,[2] *Commentary on the New Patent Act*, reprinted in 75 J. Pat. & Trademark Off. Soc'y 161, 177 (1993) (*Federico's Commentary*) ("Remarks have appeared in a few decisions and elsewhere that new uses are not patentable. . . . [I]f such remarks are interpreted to mean that a new use or application of an old machine, manufacture or composition cannot result in anything patentable then such statements are not and have never been an accurate statement of the law."); Hearing Before Sub-comm. No. 3 of the Comm. on the Judiciary, at 37 (1951) (1951 Hearings) (Federico testifying that the "definition of 'process' has been added . . . to clarify the present law as to certain types of methods as to which some doubts have been expressed. . . ."). The 1952 Act shows that the "primary significance" of adding Section 100(b) was to make clear that a method was not "vulnerable to attack, on the ground of not being within the field of patentable subject matter, merely because it may recite steps conventional from a procedural standpoint and the novelty resides in the recitation of a particular substance, which is old as such, used in the process." *Federico's Commentary* at 177; *see* S.Rep. No. 82-1979, at 17 ("The . . . definition clarifies the status of processes or methods which involve merely the new use of a known process, machine, manufacture, composition of matter, or material; they are processes or methods under the statute and may be patented provided the conditions of patentability are satisfied.").

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[2] P.J. Federico, one of the 1952 Patent Act's "principal authors," was also a chief patent examiner. *Hodosh v. Block Drug Co.*, 833 F.2d 1575, 1578 (Fed.Cir.1987). *Federico's Commentary* constitutes "an invaluable insight into the intentions of the

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drafters of the Act." *Symbol Techs., Inc. v. Lemelson Med.*, 277 F.3d 1361, 1366 (Fed.Cir.2002); *see also* George M. Sirilla & Hon. Giles S. Rich, *35 U.S.C. . . . 103: From Hotchkiss to Hand to Rich, the Obvious Patent Law Hall-of-Famers*, 32 J. Marshall L.Rev. 437, 509 (1999) (discussing Federico's and Judge Rich's role as the drafters of the 1952 Act).

In addition, in testimony requested by the Committee, P.J. Federico, a chief patent examiner at the United States Patent & Trademark Office (Patent Office), explained that under the proposed amendment a machine or manufacture may include "anything that is under the sun that is made by man." 1951 Hearings at 37; *see* S.Rep. No. 82-1979, at 5 (stating the same principle: so long as the conditions of patentability are met, anything made by man is patentable). The Supreme Court summarized the intent and meaning of these changes when it quoted and approved this famous statement. *See Diehr*, 450 U.S. at 182, 101 S.Ct. 1048.

Indeed, to achieve these ends, the 1952 Act did not merely rely on the breadth of Section 101 and the expanded definition of "process" in Section 100(b), but also added the words "or discovered" to the definition of "invention" in Section 100(a). By definition, Congress made it irrelevant whether a new process, machine, and so on was "discovered" rather than "invented." Both inventions and discoveries are eligible for patenting. This addition confirmed the principle articulated again in Section 103 that an invention "shall not be negated by the manner in which [it] . . . was made." 35 U.S.C. § 103. The language of the Act shows that the authors of the 1952 Act wanted that principle incorporated into the eligibility section of the Act as well as the patentability sections.

One final point confirming the breadth of Section 101 is the 1952 Act's deliberate decision to place the substantive requirement for "invention" in Section 103. Before 1952, the courts had used phrases including "creative work," "inventive faculty," and "flash of creative genius" which compared the existing invention to some subjective notion of sufficient "inventiveness" as the test for patentability—by definition a hindsight analysis. *See* Giles S. Rich, *Principles of Patentability*, 28 Geo. Wash. L.Rev. 393, 404 (1960). These standardless terms and tests created wildly disparate approaches to determine sufficiency for "invention." *Id.* at 403-04. Judge Rich observed that with "invention" as the test, "judges did whatever they felt like doing according to whatever it was that gave the judge his feelings—out of the evidence coupled with his past mental conditioning—and then selected those precedents which supported his conclusions." Sirilla, 32 J. Marshall L.Rev. at 501 (internal quotation marks omitted).

The 1952 Act focused its central purpose on correcting this systemic problem. "One of the great technical weaknesses of the patent system" prior to 1952 was "the lack of a definitive yardstick as to what is invention." Victor L. Edwards, Cong. Research Serv., Efforts to Establish a Statutory Standard for Invention, at 2 (1958) (Study on Standard for Invention). As Judge Rich testified at the beginning of this legislative effort in 1948, "the matter of defining invention" was "what we are trying to get away from." *Id.* at 4. As Federico put it, "invention" was "an unmeasurable quantity having different meanings for different persons." Federico's Commentary at 183 (making the statements in the context of explaining why Congress added Section 103); *Principles of Patentability*, 28 Geo. Wash. L.Rev. at 407 ("The drafters of the present statute did their best to take out of the law the undefinable concept of 'invention.' Whether lawyers will now take advantage of the terminology . . . and stop talking nonsense is up to them.").

After deliberate effort, the 1952 Act replaced any need for an "invention" or "inventiveness" measure with an objective test for "obviousness" in Section 103. *See Dann v. Johnston*, 425 U.S. 219, 225-26, 96 S.Ct. 1393, 47 L.Ed.2d 692 (1976) (explaining that although "an exercise of the inventive faculty" had been used as a judicial test, "it was only in 1952 that Congress, in the interest of uniformity and definiteness, articulated the requirement in a statute, framing it as a requirement of 'nonobviousness.'" (internal quotation marks and footnote omitted)). The official "Revision Notes" explain that Section 103 became an "explicit statement" of the "holding of patents invalid by the courts[ ] on the ground of lack of invention." S.Rep. No. 82-1979, at 18; *see Federico's Commentary* at 180 (explaining that one of the two major changes made by the 1952 amendments was "incorporating a requirement for invention in section 103." (internal quotation marks omitted)); Study for Statutory Standard of Invention (extensively reviewing Congressional efforts to redefine "invention," which culminated in adoption of Section 103). Thus, the central thrust of the 1952 Act removed "unmeasurable" inquiries into "inventiveness" and instead supplied the nonobviousness requirement of Section 103.

After enactment of the 1952 Act, both of its principal architects recognized the significance of the elimination of a subjective test for "invention." Judge Rich, a House Committee architect of the 1952 Act and later an esteemed jurist, applauded the fact that the Patent Act of 1952 makes no "reference to 'invention' as a legal requirement." *Principles of Patentability*, 28 Geo. Wash. L.Rev. at 405 (emphasis omitted). Judge Rich emphasized that using "the past tense in referring to" what "*used* to be called the requirement of 'invention'" could not be overemphasized. *Id.* (emphasis in original). Federico expressed the same sentiments. *See Federico's Commentary* at 182-83 (explaining that while perhaps the word "invented" in the prior patent act may have been the source of judicial demand for more than just novelty, Section 103 replaced any requirement for "invention").

Contemporaneous commentators also recognized that any need for "invention" had been rejected in favor of nonobviousness. *See generally*, Karl B. Lutz, *The New 1952 Patent Statute*, 35 J. Pat. Off. Soc'y 155, 157-58 (1953) (explaining that courts had long ago decided that novelty was not enough and had disagreed on how to determine how much more was necessary, but that that issue was now addressed solely by Section 103); Dean O.S. Colclough, *A New Patent Act—But the Same Basic Problem*, 35 J. Pat. Off. Soc'y 501, 510 (1953) (explaining that the "condition of inventiveness has been expressed in a variety of ways by the courts," but the "new provision on inventiveness" in Section 103 was intended to replace and codify prior law). And indeed the courts, including this court, implemented the new statute carefully and religiously. *See Graham v. John Deere Co.*, 383 U.S. 1, 14, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966) ("Section 103, for the first time in our statute, provides a condition which exists in the law and has existed for more than 100 years, but only by reason of decisions of the courts." (internal quotation marks omitted)); *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1548 (Fed.Cir.1983) (Markey, C.J.) (recognizing the district court improperly relied upon one step of a multi-step process to determine nonobviousness); *Gardner v. TEC Sys., Inc.*, 725 F.2d 1338, 1349-50 (Fed.Cir.1984) (recognizing that Section 103 sets forth the standard, and so "synergism" of a known combination is not required). Thus, any requirement for "inventiveness" beyond sections 102 and 103 is inconsistent with the language and intent of the Patent Act.

With an eye to the statutory language and its background, the Supreme Court recognized Section 101 as "a 'dynamic provision designed to encompass new and unforeseen inventions.'" *Bilski*, 130 S.Ct. at 3227 (quoting *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135, 122 S.Ct. 593, 151 L.Ed.2d 508 (2001)). Indeed, the broad interpretation of Section 101 has constitutional underpinnings. "'The subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting 'the Progress of . . . the useful Arts. . . .'" *Chakrabarty*, 447 U.S. at 315, 100 S.Ct. 2204.

In sum, any analysis of subject matter eligibility for patenting must begin by acknowledging that any new and useful process, machine, composition of matter, or manufacture, or an improvement thereof, is eligible for patent protection. While a claim may not later meet the rigorous conditions for patentability, Section 101 makes these broad categories of claimed subject matter eligible for that consideration.

III

We turn now to the limited exceptions to the broad statutory grant in Section 101 which the Supreme Court has identified: "'[l]aws of nature, natural phenomena, and abstract ideas'" are not patent eligible. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, — U.S. —, 132 S.Ct. 1289, 1293, 182 L.Ed.2d 321 (2012) (quoting *Diehr*, 450 U.S. at 185, 101 S.Ct. 1048); *see also Bilski*, 130 S.Ct. at 3225. The motivation for the exceptions to eligibility is to prevent the "monopolization" of the "basic tools of scientific and technological work," which "might tend to impede innovation more than it would tend to promote it." *Prometheus*, 132 S.Ct. at 1293 (internal quotation marks omitted).

A. Scope of the Exception

1. Generally

As the Supreme Court has explained, the relevant inquiry under the exceptions is whether the claim covers merely an abstract idea, law of nature, or natural phenomenon; or whether the claim covers a particular application of an abstract idea, law of nature, or natural phenomenon. *See Prometheus*, 132 S.Ct. at 1294 ("[T]o transform an unpatentable law of nature into a patent-eligible *application* of such a law, one must do more than simply state the law of nature while adding the words 'apply it.'" (emphasis in original)); *Bilski*, 130 S.Ct. at 3230 ("[W]hile an abstract idea, law of nature, or mathematical formula could not be patented, an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." (emphasis in original) (internal quotation marks omitted)); *Diehr*, 450 U.S. at 187, 101 S.Ct. 1048 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." (emphasis in original)); *Gottschalk v. Benson*, 409 U.S. 63, 67, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972) ("He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the *application* of the law of nature to a new and useful end." (emphasis added) (internal quotation marks omitted)).

The claims are key to this patent eligibility inquiry. A court must consider the asserted claim *as a whole* when assessing eligibility:

> In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered *as a whole*. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.

Diehr, 450 U.S. at 188, 101 S.Ct. 1048 (emphasis added). And, a court must consider the *actual* language of each claim. The majority in *Diehr* rejected the minority's approach ignoring portions of the claims: "[i]n order for the dissent to reach its conclusion it is necessary for it to read out of respondents' patent application all the steps in the claimed process which it determined were not novel or 'inventive.' That is not the purpose of the § 101 inquiry. . . ." *Id*. at 193 n. 15, 101 S.Ct. 1048 (citations omitted).

Any claim can be stripped down, simplified, generalized, or paraphrased to remove all of its concrete limitations, until at its core, something that could be characterized as an abstract idea is revealed. Such an approach would "if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious." *Id*. at 189 n. 12, 101 S.Ct. 1048; *see also Prometheus*, 132 S.Ct. at 1293. A court cannot go hunting for abstractions by ignoring the concrete, palpable, tangible limitations of the invention the patentee actually claims.

Different claims will have different limitations; each must be considered as actually written. The inquiry is a practical one to determine whether the claim, as a whole with all of its limitations, in effect covers a patent ineligible abstract idea or a patent eligible application of that idea. Thus, while the analysis will be different for each claim based on its particular limitations, the form of the analysis remains the same.

The claims in *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 14 L.Ed. 601 (1854), and a case described therein, illustrate the distinction between a patent ineligible abstract idea and a practical application of an idea. The "difficulty" in *Morse* arose with the claim in which *Morse*

> d[id] not propose to limit [him]self to the specific machinery or parts of machinery described in the . . . specification and claims; the essence of [his] invention being the use of the motive power of the electric or galvanic current . . . however developed for marking or printing intelligible characters, signs, or letters, at any distances. . . .

Id. at 112 (internal quotation marks omitted). In considering Morse's claim, the Supreme Court referred to an earlier English case that distinguished ineligible claims to a "principle" from claims "applying" that principle:

> [I]t seems that the court at first doubted, whether it was a patent for any thing more than the discovery that hot air would promote the ignition of fuel better than cold. And if this had been the construction, the court, it appears, would have held his patent to be void; because the discovery

> of a principle in natural philosophy or physical science, is not patentable.
>
> But after much consideration, it was finally decided that this principle must be regarded as well known, and that the plaintiff had invented a mechanical mode of applying it to furnaces; and that his invention consisted in interposing a heated receptacle, between the blower and the furnace, and by this means heating the air after it left the blower, and before it was thrown into the fire. Whoever, therefore, used this method of throwing hot air into the furnace, used the process he had invented, and thereby infringed his patent, although the form of the receptacle or the mechanical arrangements for heating it, might be different from those described by the patentee.

Id. at 116. The claim in Morse itself was impermissible because it covered "'an effect produced by the use of electro-magnetism, distinct from the process or machinery necessary to produce it.'" *The Telephone Cases*, 126 U.S. 1, 534, 8 S.Ct. 778, 31 L.Ed. 863 (1888) (quoting *Morse*, 56 U.S. (15 How.) at 120). This was in contrast to a sustained claim that was limited to:

> making use of the motive power of magnetism, when developed by the action of such current or currents, substantially as set forth in the . . . description, . . . as means of operating or giving motion to machinery, which may be used to imprint signals upon paper or other suitable material, or to produce sounds in any desired manner, for the purpose of telegraphic communication at any distances.

Id. (first ellipsis added, second ellipsis in original) (quoting *Morse*, 56 U.S. (15 How.) at 85). "'The effect of [*Morse*] was, therefore, that the use of magnetism as a motive power, without regard to the particular process with which it was connected in the patent, could not be claimed, but that its use in that connection could.'" *Benson*, 409 U.S. at 68, 93 S.Ct. 253 (quoting *The Telephone Cases*, 126 U.S. at 534, 8 S.Ct. 778).

These examples illustrate that the inquiry under the abstract ideas exception deals not merely with breadth, because the "hot air" claims were broad and covered many "mechanical arrangements" but yet found patent eligible. The concern, which has become clearer through the Supreme Court's more recent precedents, is whether the claim seeks to patent an idea itself, rather than an application of that idea.

2. Meaningful limitations

The relevant inquiry must be whether a claim includes *meaningful* limitations restricting it to an application, rather than merely an abstract idea. *See Prometheus*, 132 S.Ct. at 1297 ("[D]o the patent claims add *enough* to their statements of the correlations to allow the processes they describe to qualify as patent-eligible processes that *apply* natural laws?" (emphasis in original)); *see also Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1323 (Fed.Cir.2012) ("[T]o impart patent-eligibility to an otherwise unpatentable process under the theory that the process is linked to a machine, the use of the machine must impose meaningful limits on the claim's scope." (internal quotation marks omitted)). An abstract idea is one that has no reference to material objects or specific examples—*i.e.*, it is not concrete. *See* Merriam-Webster's Collegiate Dictionary 5 (11th ed.2003) (defining abstract as "disassociated from any specific instance . . . expressing a quality apart from an object

<the word *poem* is concrete, poetry is [abstract]>"). A claim may be premised on an abstract idea—the question for patent eligibility is whether the claim contains limitations that meaningfully tie that idea to a concrete reality or actual application of that idea.

Indeed, the Supreme Court repeatedly has stated that a claim touching upon a natural phenomenon, abstract idea, or law of nature is not, for that reason alone, ineligible for patenting. The Supreme Court clarified the "commonplace" principle "that an *application* of a law of nature or mathematical formula to a known structure . . . may well be deserving of patent protection." *Diehr*, 450 U.S. at 187, 101 S.Ct. 1048 (emphasis in original). For these reasons, a claim does not become ineligible simply because it applies a basic tool. *Id.*; *see Prometheus*, 132 S.Ct. at 1294 (explaining that the fact that a claim uses a basic tool does not mean it is not eligible for patenting). The struggle is in drawing the line between claims that are and are not meaningfully limited; fortunately, the Supreme Court's own cases provide the guideposts for doing so.

First, we know a claim is not meaningfully limited if it merely describes an abstract idea or simply adds "apply it." *See Prometheus*, 132 S.Ct. at 1294, 1297. The broad claim in *Morse* provides a striking example of this. We also know that, if a claim covers all practical applications of an abstract idea, it is not meaningfully limited. *See id.* at 1301-02. For example, "[a]llowing petitioners to patent risk hedging would pre-empt use of this approach in *all fields*, and would effectively grant a monopoly over an abstract idea." *Bilski*, 130 S.Ct. at 3231 (emphasis added). While this concept is frequently referred to as "pre-emption," it is important to remember that all patents "pre-empt" some future innovation in the sense that they preclude others from commercializing the invention without the patentee's permission. Pre-emption is only a subject matter eligibility problem when a claim preempts all practical uses of an abstract idea. For example, the claims in *Benson* "purported to cover *any* use of the claimed method in a general-purpose digital computer of any type." 409 U.S. at 64, 93 S.Ct. 253 (emphasis added). The claims were not allowed precisely because they pre-empted essentially all uses of the idea:

> It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting [binary-coded decimal] numerals to pure binary numerals were patented in this case. The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that . . . the patent would *wholly* pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.

Id. at 71-72, 93 S.Ct. 253 (emphasis added). When the steps of the claim "must be taken in order to apply the [abstract idea] in question," the claim is essentially no different from saying apply the abstract idea. *Prometheus*, 132 S.Ct. at 1299-1300. It is not the breadth or narrowness of the abstract idea that is relevant, but whether the claim covers every practical application of that abstract idea.[3]

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[3] The pre-emption analysis must also recognize that the Patent Act does not halt or impede academic research, without commercial ends, to test, confirm, or improve a patented invention. *See Sawin v. Guild*, 21 F. Cas. 554, 555 (C.C.D.Mass.1813) (No. 12,391) (Story, J.) (infringement does not occur when the invention is used "for the mere purpose of philosophical

And, we know that, even if a claim does not wholly pre-empt an abstract idea, it still will not be limited meaningfully if it contains only insignificant or token pre- or post-solution activity—such as identifying a relevant audience, a category of use, field of use, or technological environment. *See Prometheus*, 132 S.Ct. at 1297-98, 1300-01; *Bilski*, 130 S.Ct. at 3230-31; *Diehr*, 450 U.S. at 191-92 & n. 14, 101 S.Ct. 1048; *Parker v. Flook*, 437 U.S. 584, 595 n. 18, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978).

Finally, the Supreme Court has told us that a claim is not meaningfully limited if its purported limitations provide no real direction, cover all possible ways to achieve the provided result, or are overly-generalized. *See Prometheus*, 132 S.Ct. at 1300 ("[S]imply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable."); *Fort Props.*, 671 F.3d at 1323 ("Such a broad and general limitation does not impose meaningful limits on the claim's scope." (internal quotation marks omitted)). For example, in *Prometheus*, "the 'determining' step tells the doctor to determine the level of the relevant metabolites in the blood, through whatever process the doctor or the laboratory wishes to use." 132 S.Ct. at 1297. *Diehr* explained that the application in *Flook* "did not purport to explain how these other variables were to be determined, nor did it purport to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system," and that "[a]ll that it provides is a formula for computing an updated alarm

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experiment, or to ascertain the verity and exactness of the specification").

limit." *Diehr*, 450 U.S. at 186-87, 101 S.Ct. 1048 (footnote omitted) (internal quotation marks omitted).

Just as the Supreme Court has told us when a claim likely should not be deemed meaningfully limited, it has also given us examples of meaningful limitations which likely remove claims from the scope of the Court's judicially created exceptions to Section 101. Thus, a claim is meaningfully limited if it requires a particular machine implementing a process or a particular transformation of matter. *See Bilski*, 130 S.Ct. at 3227 ("This Court's precedents establish that the machine-or-transformation test is a useful and important clue . . . for determining whether some claimed inventions are processes under § 101."); *see also Prometheus*, 132 S.Ct. at 1302-03; *Diehr*, 450 U.S. at 184, 192, 101 S.Ct. 1048. A claim also will be limited meaningfully when, in addition to the abstract idea, the claim recites added limitations which are essential to the invention. In those instances, the added limitations do more than recite pre- or post-solution activity, they are central to the solution itself. And, in such circumstances, the abstract idea is not wholly pre-empted; it is only preempted when practiced in conjunction with the other necessary elements of the claimed invention. *See Diehr*, 450 U.S. at 187, 101 S.Ct. 1048 ("[T]he respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process."); *see also Prometheus*, 132 S.Ct. at

1298-99 (discussing *Diehr*, 450 U.S. 175, 101 S.Ct. 1048).[4]

3. Computer-specific limitations

When assessing computer implemented claims, while the mere reference to a general purpose computer will not save a method claim from being deemed too abstract to be patent eligible, the fact that a claim is limited by a tie to a computer is an important indication of patent eligibility. *See Bilski*, 130 S.Ct. at 3227. This is true both because its tie to a machine moves it farther away from a claim to no more than an idea and because that same tie makes it less likely that the claims will pre-empt all practical applications of the idea.

The key to this inquiry is whether the claims tie the otherwise abstract idea to a *specific way* of doing something with a computer, or a *specific computer* for doing something; if so, they likely will be patent eligible, unlike claims directed to *nothing more than the idea* of doing that thing on a computer. While no particular type of limitation is necessary, meaningful limitations may include the computer being part of the solution, being integral to the performance of the method, or containing an improvement in computer technology. *See SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1332-33 (Fed.Cir.2010) (noting that "a machine," a GPS receiver, was "integral to each of the claims at issue" and "place[d] a meaningful limit on the scope of the claims"). A special purpose computer, *i.e.*, a new machine, specially designed to implement a process may be sufficient. *See Alappat*, 33 F.3d at 1544 ("Although many, or arguably even all, of the means elements recited in claim 15 represent circuitry elements that perform mathematical calculations, which is essentially true of all digital electrical circuits, the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine for converting discrete waveform data samples into anti-aliased pixel illumination intensity data to be displayed on a display means. This is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result." (footnotes omitted)); *see also id.* at 1545 ("We have held that such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software.").

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[4] Judge Lourie's opinion concludes that the system claims are not patent eligible in part because it is *now* routine for computers to perform the functions described—because the world has changed, as the opinion puts it. Lourie Op. at 1291-92. Using what has *become* routine in 2013 to determine what *was* inherent in a concept in the early 1990s injects hindsight into the eligibility analysis and fails to recognize that patent eligibility, like all statutory patentability questions, is to be measured as of the filing date. *See, e.g.*, 35 U.S.C. §§ 102, 103.

At bottom, where the claim is tied to a computer in such a way that the computer plays a meaningful role in the performance of the claimed invention, and the claim does not pre-empt virtually all uses of an underlying abstract idea, the claim is patent eligible.

B. What the Exception Is Not About

In specifying what the scope of the abstract idea exception to patent eligibility is, it is also important to specify what the analysis is *not*. ***Flook*** suggested that an abstract idea is to be "treated as though it were a familiar part of the prior art." 437 U.S. at 592, 98 S.Ct. 2522. *Prometheus* used the language of "inventive concept" to describe the "other elements or a combination of elements . . . sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself" and described purported limitations as "routine" or "conventional." 132 S.Ct. at 1294, 1298-99. Such language should not be read to conflate principles of patent eligibility with those of validity, however. Nor should it be read to instill an "inventiveness" or "ingenuity" component into the inquiry.

The eligibility inquiry is not an inquiry into obviousness, novelty, enablement, or any other patent law concept. Each section plays a different role and no one section is more important than any other. Section 112 of Title 35 protects the public by ensuring that patents fully disclose, enable, and particularly claim the invention. Sections 102 and 103 ensure that the public is free to use what was previously known and the obvious variants thereof. The Section 101 eligibility inquiry determines whether a claim is limited meaningfully to permissible subject matter, as distinct from the validity requirements of the other sections.

The Supreme Court repeatedly has cautioned against conflating the analysis of the conditions of patentability in the Patent Act with inquiries into patent eligibility. *See Diehr*, 450 U.S. at 190, 101 S.Ct. 1048 ("The question therefore of whether a particular invention is novel is wholly apart from whether the invention falls into a category of statutory subject matter." (internal quotation marks omitted)); *see also Prometheus*, 132 S.Ct. at 1304 (recognizing that "to shift the patent-eligibility inquiry entirely to [§§ 102, 103, and 112] risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do"). Because a new combination of old steps is patentable, as is a new process using an old machine or composition, subject matter eligibility must exist even if it was obvious to use the old steps with the new machine or composition. Otherwise the eligibility analysis ignores the text of sections 101 and 100(b), and reads Section 103 out of the Patent Act.

The Supreme Court's reference to "inventiveness" in *Prometheus* must be read as shorthand for its inquiry into whether implementing the abstract idea in the context of the claimed invention inherently requires the recited steps. Thus, in *Prometheus*, the Supreme Court recognized that the additional steps were those that *anyone* wanting to use the natural law would *necessarily* use. *See Prometheus*, 132 S.Ct. at 1298. If, to implement the abstract concept, one *must* perform the additional step, then the step merely separately restates an element of the abstract idea, and thus does not further limit the abstract concept to a practical application.[5]

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[5] Judge Lourie's opinion takes the reference to an "inventive concept" in *Prometheus* and imbues it with a life that is neither consistent with the Patent Act's description of Section 101 nor with the totality of Supreme Court precedent regarding the narrow exceptions thereto. He concludes that "inventive concept" must refer to a "genuine human contribution to the claimed subject matter." Lourie Op. at 1283. He, thus, injects an "ingenuity" requirement into the abstract exception inquiry. It is inconceivable to us that the Supreme Court would choose to undo so much of what Congress tried to accomplish in the 1952 Patent Act, and to do so by the use of one phrase in one opinion.

C. Nature of Our Inquiry

Because we are assessing judicially created exceptions to a broad statutory grant, one of the principles that must guide our inquiry is that judge-made exceptions to properly enacted statutes are to be narrowly construed. Indeed, the Supreme Court has cautioned that, to avoid improper narrowing by courts of congressional enactments, resort to judge-made exceptions to statutory grants must be rare. *See, e.g.*, *W. Union Tel. Co. v. Lenroot*, 323 U.S. 490, 514, 65 S.Ct. 335, 89 L.Ed. 414 (1945) ("[T]he judicial function does not allow us to disregard that which Congress has plainly and constitutionally decreed and to formulate exceptions which we think, for practical reasons, Congress might have made had it thought more about the problem."); *United States v. Rutherford*, 442 U.S. 544, 559, 99 S.Ct. 2470, 61 L.Ed.2d 68 (1979) ("Whether, as a policy matter, an exemption should be created is a question for legislative judgment, not judicial inference.").

Congress drafted Section 101 broadly and clearly, and anything beyond a narrow exception would be impermissibly in tension with the statute's plain language and design. *See Chakrabarty*, 447 U.S. at 308, 100 S.Ct. 2204 ("In choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope."); *id.* at 315, 100 S.Ct. 2204 ("Broad general language is not necessarily ambiguous when congressional objectives require broad terms."); *cf. Bilski*, 130 S.Ct. at 3226 ("This Court has not indicated that the existence of these well-established exceptions gives the Judiciary *carte blanche* to impose other limitations that are inconsistent with the text and the statute's purpose and design."). As the Supreme Court has made clear, too broad an interpretation of these exclusions from the statutory grant of Section 101 "could eviscerate patent law." *Prometheus*, 132 S.Ct. at 1293. It is particularly important that Section 101 not be read restrictively to exclude "unanticipated inventions" because the most beneficial inventions are "often unforeseeable." *See Chakrabarty*, 447 U.S. at 316, 100 S.Ct. 2204; *see also J.E.M. Ag Supply*, 534 U.S. at 135, 122 S.Ct. 593 (describing Section 101 as "a dynamic provision designed to encompass new and unforeseen inventions."). Broad inclusivity is the Congressional goal of Section 101, not a flaw. Judicially created exceptions must not be permitted to thwart that goal.

Mindful of these admonitions, we turn to CLS Bank's contention that the presumption of validity should not apply to patent eligibility challenges. CLS Bank contends that the presumption of validity only applies to *statutory* bases for invalidating a patent—35 U.S.C. Sections 102, 103, 112, and 251. Thus, although the Supreme Court invalidated the patent before it in *Prometheus* because it fell within one of the exceptions to patent eligibility—the law of nature exception—CLS Bank contends that the Section 101 inquiry does not involve the presumption of validity in the same way the statutory bases for invalidity do. We disagree.[6]

Before issuing a patent, the Patent Office rejects claims if they are drawn to ineligible subject matter, just as it rejects claims if not compliant with Sections 102, 103, or 112. Thus, when a patent issues, it does so after the Patent Office assesses and endorses its eligibility under Section 101, just as it assesses and endorses its patentability under the other provisions of Title 35. *See Microsoft Corp. v. i4i Ltd. P'ship*, — U.S. —, 131 S.Ct. 2238, 2242, 180 L.Ed.2d 131 (2011) ("Congress has set forth the prerequisites for issuance of a patent, which the PTO must evaluate in the examination process. To receive patent protection a claimed invention must, among other things, fall within one of the express categories of patentable subject matter, § 101, and be novel, § 102, and nonobvious, § 103."). We see no reason not to apply the same presumption of validity to that determination as we do to the Patent Office's other patentability determinations.

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[6] In its reply brief, CLS Bank intimates that the presumption of validity does not apply because a challenge to patent eligibility is not a listed defense to infringement under 35 U.S.C. § 282(b). This issue, however, was not fully briefed by the parties and, accordingly, we do not address it.

Because we believe the presumption of validity applies to all challenges to patentability, including those under Section 101 and the exceptions thereto, we find that any attack on an issued patent based on a challenge to the eligibility of the subject matter must be proven by clear and convincing evidence. *Cf. Microsoft*, 131 S.Ct. at 2242 ("We consider whether § 282 requires an invalidity defense to be proved by clear and convincing evidence. We hold that it does."). We believe, moreover, that application of this presumption and its attendant evidentiary burden is consistent with the Supreme Court's admonition to cabin the judicially created exceptions to Section 101 discussed above.

With these principles in mind, we turn to the specific claims here. We start with the system claims, which all four of us agree are patent-eligible.

IV

At the outset, a computer-implemented invention is eligible for patenting under Section 101. Computers are "machines." Machines are expressly eligible subject matter under Section 101. Having said that, however, were it not for software, programmable computers would be useless. A computer without software collects dust, not data. The operation of the software changes the computer, altering its ability to perform one function or another as the software indicates. This court long ago recognized that a computer programmed to perform a specific function is a new machine with individualized circuitry created and used by the operation of the software. *See Alappat*, 33 F.3d at 1545. The combination of machine and software "creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *Id.*; *see Morse*, 56 U.S. (15 How.) at 113 ("[H]e says he does not confine his claim to the machinery or parts of machinery, which he specifies. . . ."); *cf. Bilski*, 130 S.Ct. at 3227 (an important clue that a claim embracing an abstract idea is patent eligible is if its use is tied to a machine).

The combination of new software and a computer machine accomplishes wonders by reducing difficult processes—like determining where someone is on the earth, instantly translating Chinese to English, or performing hundreds of functions in a hand-held device called a "smart phone"—into a series of simple steps. For example, the Supreme Court upheld precisely this kind of combination for the computer-implemented parameters to run a rubber press—breaking the known steps into tiny mathematical calculations that advanced a known function beyond prior capabilities. *See Diehr*, 450 U.S. at 179, 101 S.Ct. 1048. Indeed, much of the innovative energy and investment of the past few decades have focused on software improvements that have produced revolutions in modern life, including the "smart phone."

Nonetheless we must examine whether, despite falling within the plain language of Section 101, clear and convincing evidence shows that a claim to a computer-implemented invention is barred from patent eligibility by reason of the narrow judicial prohibition against claiming an abstract idea. In *Bilski*, the Court analyzed whether, and under what circumstances, a method claim's tie to a machine could make it a practical application of the underlying idea, and thus patent-eligible. The Court explained that a machine tie, though not required, is a "useful and important clue" that a method claim is patent-eligible. *Bilski*, 130 S.Ct. at 3227. If tying a method to a machine can be an important indication of patent-eligibility, it would seem that a claim embodying the *machine itself*, with all its structural and functional limitations, would rarely, if ever, be an abstract idea. *Cf. Diehr*, 450 U.S. at 187, 101 S.Ct. 1048.

Indeed, in theory, an inventor could claim a machine combination with circuitry, transistors, capacitors, and other tangible electronic components precisely arrayed to accomplish the function of translating Chinese to English. These complex interrelated machine components would squarely fit within the terms of Section 101 and involve nothing theoretical, highly generalized, or otherwise abstract. The fact that innovation has allowed these machines to move from vacuum-tube-filled specialized mechanical behemoths, to generalized machines changed by punch cards, to electronically programmable machines that can fit in the palm of your hand, does not render them abstract.[7]

Analyzing each asserted system claim as a whole, as we are required to do, demonstrates that each does not claim anything abstract in its machine embodiments. Especially in light of the fact that this appeal involves summary judgment of invalidity, and so requires clear and convincing evidence of invalidity, for the following reasons we would reverse the district court.

V

Claim 26 of the '375 Patent is typical of Alice's system claims and recites:

> A *data processing system* to enable the exchange of an obligation between parties, the system comprising:
>
> *a communications controller*,

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[7] We must disagree with Judge Lourie that a computer must do something other than what a computer does before it may be considered a patent-eligible invention. *See* Lourie Op. at 1286 ("At its most basic, a computer is just a calculator capable of performing mental steps faster than a human could. Unless the claims require a computer to perform operations that are not merely accelerated calculations, a computer does not itself confer patent eligibility."). Everything done by a computer can be done by a human. Requiring a computer to do something that a human could not would mean that computer implementation could never produce patent eligibility. If a computer can do what a human can in a better, specifically limited way, it could be patent eligible. Indeed, even an increase in speed alone may be sufficient to result in a meaningful limitation; if a computer can perform a process that would take a human an entire lifetime, a claim covering that solution should be sufficiently limited to be patent eligible.

a first party device, coupled to said communications controller,

a data storage unit having stored therein

> (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and
>
> (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

a computer, coupled to said data storage unit and said communications controller, that is configured to

> (a) *receive a transaction from said first party device via said communications controller*;
>
> (b) *electronically adjust* said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and
>
> (c) *generate an instruction* to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

'375 Patent claim 26 (emphases added).

Even viewed generally, the claim covers the use of a computer and other hardware specifically programed to solve a complex problem. Specifically, the claimed data processing system is limited to an implementation of the invention that includes at least four separate structural components: a *computer*, a first party *device*, a data storage *unit*, and a communications *controller* coupled via machine components to the computer and the first party device. The claim further limits the system by requiring a structural configuration that "receive[s]," "electronically adjust[s]," and "generate[s]" according to the specific requirements of the system. These are traditional hardware claims and the '375 Patent discloses at least thirty-two figures which provide detailed algorithms for the software with which this hardware is to be programmed.

Lest it be said that these structural and functional limitations are mere conventional post-solution activity that is not integral to the performance of the claimed system, the specification explains implementation of the recited special purpose computer system. It states, for example, that the "core of the system hardware is a collection of data processing units." '375 Patent col. 7 ll. 22-23. Each processing unit "is operably connected with . . . one or more mass data storage units . . . to store all data received from stakeholders, and other data relating to all other software operations generating or retrieving stored information." *Id.* col. 7 ll. 39-43. The specification also explains that the communications controllers "effect communications between the processing units . . . and the various external hardware devices used by the stakeholders to communicate data or instructions to or from the processing units." *Id.* col. 7 ll. 46-52. The computer can connect to the communications controller by means of another machine, a modem. *Id.* col. 7 ll. 57-60.

The specification also includes numerous flowcharts that provide algorithm support for the functions recited in the claims. Each processor in the claimed system runs applications software that is written to implement the algorithms in Figures 8 to 16 and 18 to 40. *See id.* col. 7 ll. 26-31. As just one example, the system performs the algorithm depicted in Figure 16 (shown below) to confirm that parties are able to exchange obligations ("matched order confirmation"). *See, e.g., id.* col. 20 l.54-col. 21 l.18.

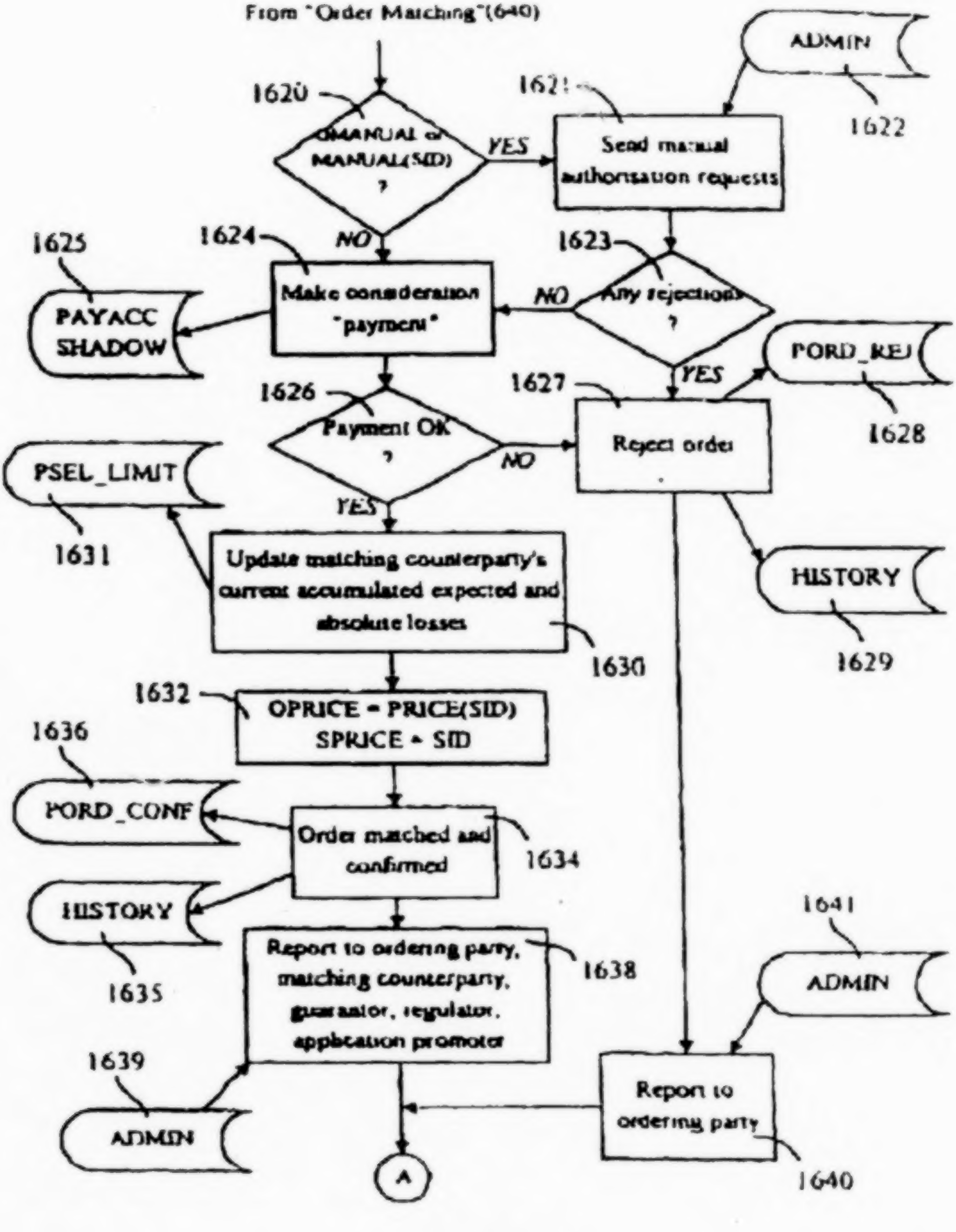
From "Order Matching"(640)
1620
OMANUAL or MANUAL(SID) ?
YES
1621
Send manual authorisation requests
ADMIN
1622
NO
1624
1625
Make consideration "payment"
PAYACC SHADOW
1623
Any rejections ?
NO
YES
PORD_REJ
1628
1627
Reject order
1626
Payment OK ?
NO
YES
PSEL_LIMIT
1631
Update matching counterparty's current accumulated expected and absolute losses
1630
HISTORY
1629
1632
OPRICE = PRICE(SID)
SPRICE = SID
1636
PORD_CONF
Order matched and confirmed
1634
HISTORY
1635
1641
ADMIN
Report to ordering party, matching counterparty, guarantor, regulator, application promoter
1638
1639
ADMIN
Report to ordering party
1640
A

Fig. 16

The specification states that the confirmation algorithm includes the step of "creating transactions in the payment shadow file." *Id*. col. 20 ll. 62-64. This step corresponds to blocks 1624 and 1625 in Figure 16. After creating these transactions, the system "checks that 'consideration payment' was effected successfully" (block 1626 in Figure 16), which requires determining whether the required consideration amount is available in the payment shadow file. *Id.* col. 20 l.64-col. 21 l.1. If there is insufficient consideration, the matched order is rejected (block 1627). *Id.* col. 21 ll. 1-4. This portion of the specification thus provides algorithm support for the "electronically adjust" element of claim 26, in which the system adjusts accounts "after ensuring that said first party and/or said second party have adequate value in" their accounts. *Id.* claim 26.

Labeling this system claim an "abstract concept" wrenches all meaning from those words, and turns a narrow exception into one which may swallow the expansive rule (and with it much of the investment and innovation in software). Nor is claim 26 even the narrowest, most detailed claim on appeal. The patents at issue contain dependent claims which include additional structural and functional limitations that render the system even more concrete. Claim 36, for example, further comprises "means for allowing said first party to acquire an item from said second party, wherein the exchange obligation relates to said item." This means-plus-function element is limited to the specific algorithms that the specification teaches as performing the recited function. Dependent claim 37 limits the data processing system to one that "further compris[es] a second party device, wherein said computer is further configured to receive a transaction from said second party device via said communications controller." This adds a fifth structure, the second party device, to the required system.

The '720 Patent's claims recite similar structure and programming. The claims recite a data processing system comprising a data storage unit coupled to a computer. *See, e.g.*, '720 Patent claim 1. The computer is configured (programmed) to perform the "receive," "electronically adjust," and "generate" functions. *Id.* Certain dependent claims add additional structural and functional limitations that show even more clearly that the claims are directed to a concrete and practical application of any underlying idea. Claims 27, 59, 67, 79, and 84, for example, limit the system to one with "means for allowing said first party to acquire an item from said second party." The specific structure and functions recited in these claims, which are integral to performing the invention, show that the '720 Patent's claims are directed to practical applications of the underlying idea and thus are patent-eligible.

The claims do not claim only an abstract concept without limitations that tie it to a practical application. Confirming this, someone can use an escrow arrangement in many other applications, without computer systems, and even with computers but in other ways without infringing the claims. *See* Appellant's En Banc Resp. Br. 40. Nor is this simply a case where a claim has been limited to a particular field. *Cf. Bilski*, 130 S.Ct. at 3231. Indeed, because they require a machine, the claims cannot be infringed even in this field, and even if a human performs the claimed steps through a combination of physical or mental steps. It would be improper for the court to ignore these limitations and instead attempt to identify some "gist" or "heart" of the invention. *See Diehr*, 450 U.S. at 188, 101 S.Ct. 1048 (it is improper to dissect the claims; they must be considered as a whole); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 345, 81 S.Ct. 599, 5 L.Ed.2d 592 (1961) ("[T]here is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention.").

We next test the additional elements in addition to any abstract idea of an escrow present in the claim. The recited steps are not inherent in the process of using an escrow. One can conduct an escrow without a data processing system that includes a data storage unit coupled to a computer which has been modified by software to receive transactions, adjust records, and generate electronic instructions according to specific structural limitations in both software and hardware formats. These structural elements are additional steps to an escrow, not inherent in it.

Further, we detect no clear and convincing evidence in this record that as of the critical time the steps recited were used commonly in computer implemented prior art practicing the abstract concept implicated here. As explained above, whether the additional steps were routine in some other context is not the inquiry: a combination of old processes is patent eligible subject matter. 35 U.S.C. § 100(b). As discussed above, nonobviousness is not an issue under Section 101; neither is "invention." Instead, the question is whether these steps are inherent in an escrow. This record contains no clear and convincing evidence to that effect. Instead, much of the information relied upon by CLS Bank is not even "prior art," especially given that some claims may have priority to the early 1990's. *See* Respondent's Br. at 28. A use of a computer is not inherent in an escrow, and the record gives no reason to conclude that use of machines in the specific claimed system would "involve well-understood, routine, conventional activity previously engaged in by researchers in the field." *Prometheus*, 132 S.Ct. at 1294. Rapid changes in computer and telecommunication technology occurred in the early 1990's. While apparently routine at the present time to use computers to perform instantaneous international financial transactions, this court will not engage in the hindsight error of speculating about the state of that technology over twenty years ago.

Finally, these limitations are not stated at a high level of generality. These system limitations do not recite only using the steps of an escrow as applied to a particular field of commerce. Because of the number and specificity of the structural limitations, these claims have narrow, if any, relevant pre-emptive effect. Under Section 101, even a process made up of old processes is patent eligible; so too must be a new machine made to perform even old processes.

The claims here are analogous to those found patent eligible in *Diehr*. The claims related to a method that used a machine, an abstract idea, and other steps to cure rubber. *See Diehr*, 450 U.S. at 179 n. 5, 101 S.Ct. 1048. The examiner rejected the claims because he deemed the additional steps were "conventional and necessary to the process." *Id.* at 180-81, 101 S.Ct. 1048 (internal quotation marks omitted). Those steps included steps that sound utterly old and routine: "heating said mold," "comparing" data, "constantly determining the temperature of the mold," "repetitively calculating," and "opening the press." *Id.* at 179 n. 5, 101 S.Ct. 1048. Indeed, even the Arrhenius equation was well-known in the art, but in combination was eligible.

The Supreme Court acknowledged these fact findings about the known status of various elements of the claim in *Diehr*, but it nonetheless reversed. It stated that the claims were patent eligible because they were "drawn to an industrial process for the molding of rubber products." *Id.* at 192-93, 101 S.Ct. 1048. In doing so, the Court explained that the claims "describe[d] a process of curing rubber beginning with the loading of the mold and ending with the opening of the press and the production of a synthetic rubber product." *Id.* at 193 n. 15, 101 S.Ct. 1048. Indeed, the computer system supplied the speed, accuracy, reliability, and automaticity that enhanced and applied the known rubber molding process and formulae. Moreover, as the Supreme Court also explained in *Bilski*, a method linked to a machine exhibits a "useful and important clue" that even the process alone (let alone a system claim that expressly recites complex machine combinations) is patent-eligible. *Bilski*, 130 S.Ct. at 3227.

Here, the claim recites a machine and other steps to enable transactions. The claim begins with the machine acquiring data and ends with the machine exchanging financial instructions with other machines. The "abstract idea" present here is not disembodied at all, but is instead integrated into a system utilizing machines. In sum, the system claims are indistinguishable from those in *Diehr*. For these reasons, the system claims are not directed to patent ineligible subject matter. We would therefore reverse the summary judgment of invalidity for ineligibility of the system claims and remand them for further consideration.

VI

Claim 33 of the '479 Patent is representative of the method claims and recites:

> A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

> (a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
>
> (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;
>
> (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these [sic] transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and
>
> (d) at the end-of-day, the supervisory institution instructing one of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

'479 Patent col. 65 ll. 23-50. Alice concedes that claims 39 to 41 of the '375 Patent rise or fall with the method claims, and so we will not separately analyze them. Petitioner's Br. 50 n. 3.

At the outset, the invention claims a "process." By definition, a process is statutory subject matter under Section 101—whether or not the recited elements are "old." 35 U.S.C. § 100(b). Thus, the inquiry shifts to seek clear and convincing evidence that the claim, nonetheless, is ineligible for patenting because it falls within one of the judicial exceptions. Here, the question asks whether the claim is abstract.

The claim describes the general and theoretical concept of using a neutral intermediary in exchange transactions to reduce risk that one party will not honor the deal, *i.e.*, an escrow arrangement. The record in this case shows that this area of art has used the fundamental concept of an intermediary in this context for centuries, if not longer. *See* Petitioners' Br. 36. Thus, this claim embodies elements of abstractness which propel this court into a further examination of its eligibility. Obviously, the claim does not simply state "use an escrow." Consequently, we must determine whether the recited steps are inherent in an escrow and claimed at a high level of generality, such that in fact the claim is not to a practical application of the concept of an escrow, but in effect claims the abstract concept of an escrow. If this claim exhibits those infirmities, it is likely to also exhibit a broad pre-emptive effect. Thus, we turn to the additional limitations.

The first claimed step involves creating shadow credit and debit records for the parties to the transaction. This highly generalized step is nothing but a recitation of a step inherent in the concept of an escrow. Further, the record again shows that bookkeepers have long kept track of accounts in this fashion as a basic form of bookkeeping. Appellant's Br. 39 (citing Richard A. Brown, *A History of Accounting and Accountants* 93 (1905)). The step is not just predominant in the prior art, but an inherent part of any escrow arrangement.

The second claimed step involves obtaining the values for the previously created accounts to allow for their later manipulation. This generalized step is also inherent in the concept of an escrow. To determine the credit to one party and the debit to the other requires a starting place for the adjustments. *Cf. Bilski*, 130 S.Ct. at 3231 (holding claim not directed to patent-eligible subject matter because establishing "inputs" for the equation required done according to well-known techniques). This step only recites another inherent feature of an escrow. Similarly, the third step involves adjusting the account balances to reflect the parties' trading activity. The fourth step likewise adds nothing beyond the well-known procedures used in the concept of an escrow: an instruction to pay or deduct funds is made. Again, the record shows that an intermediary cannot perform an escrow arrangement without either paying or ordering someone to pay the proper amounts.

Thus, each step individually recites merely a general step inherent within the concept of an escrow, using a third party intermediary in this fashion. While the claim certainly limits use of an escrow to the context of this particular field, that attempted limitation is not enough. *Cf. Bilski*, 130 S.Ct. at 3231 (stating that "limiting an abstract idea to one field of use or adding token post-solution components did not make the concept patentable"); *see Flook*, 437 U.S. at 586, 98 S.Ct. 2522 (explaining that other steps in the process did not limit the claim to a particular application, even though they applied generally to hydrocarbon conversion processes).

Finally, we note that the method claims do not mention a computer. *CLS Bank*, 768 F.Supp.2d at 236. Even so, the district court assumed "the single fact" that the "method claims are implemented by computer. . . ." *Id.* Putting to the side whether this construction was correct, *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed.Cir.2005) (en banc) (courts generally should not read limitations from the specification into a claim), even assuming the method claims require use of a computer in some unspecified way, this implicit reference to computer "implementtation" is not, by itself, enough.

To sum up, the claim as a whole embraces using an escrow to avoid risk of one party's inability to pay—an abstract concept. Viewed as a whole, the claim is indistinguishable from the claim in *Bilski*, 130 S.Ct. at 3231. Viewed individually, the recited elements only recite the steps inherent in that concept (stated at a high level of generality) and implement those steps according to methods long used in escrows according to the record in this case. As explained, the attempt to limit the escrow concept to a particular field is not sufficient. *See id*. Thus, like Judge Lourie, we would hold the method claims in this case are not eligible under Section 101, but would do so for different reasons than he articulates.

VII

For the reasons stated above, Chief Judge Rader and Judges Linn, Moore, and O'Malley would reverse the district court's determination that the system claims address subject matter that is not patent eligible. Chief Judge Rader and Judge Moore, however, would affirm the district court's conclusion that the method and media claims are patent ineligible. Chief Judge Rader and Judge Moore, thus, dissent in part and concur in part in the judgment the court enters today.

Judges Linn and O'Malley believe that, if the method claims could be interpreted as in part VI, they would be patent ineligible. But, for the reasons stated in their separate opinion, they believe that, as properly construed on this record and in this procedural posture, the method claims are patent eligible. Accordingly, they dissent from all aspects of the judgment the court enters today.

With these results in mind, all four of us would remand for further consideration of the conditions and requirements of the Patent Act and further proceedings, as appropriate.

Dissenting-in-part opinion filed by MOORE, Circuit Judge, in which RADER, Chief Judge, and LINN and O'MALLEY, Circuit Judges, join.

Dissenting-in-part opinion filed by MOORE, Circuit Judge, in which RADER, Chief Judge, and LINN and O'MALLEY, Circuit Judges, join.

I am concerned that the current interpretation of § 101, and in particular the abstract idea exception, is causing a free fall in the patent system. The Supreme Court has taken a number of our recent decisions and, in each instance, concluded that the claims at issue were not patent-eligible. *See Bilski*, *Prometheus*, *Myriad* (under consideration). Today, several of my colleagues would take that precedent significantly further, lumping together the asserted method, media, and system claims, and holding that they are all patent-ineligible under § 101. Holding that all of these claims are directed to no more than an abstract idea gives staggering breadth to what is meant to be a narrow judicial exception. And let's be clear: if all of these claims, including the system claims, are not patent-eligible, this case is the death of hundreds of thousands of patents, including all business method, financial system, and software patents as well as many computer implemented and telecommunications patents.[1] My colleagues believe that the trajectory the Supreme Court has set for § 101 requires us to conclude that *all* of the claims at issue here are directed to unpatentable subject matter. Respectfully, my colleagues are wrong.

To get to their conclusion, my colleagues trample upon a mountain of precedent that requires us to evaluate each claim as a whole when analyzing validity. As the Supreme Court recognized in *Bilski*, whether a claim is tied to a machine is "an important and useful tool" for assessing that it is directed to patent eligible subject matter. *Bilski v. Kappos*, — U.S. —, 130 S.Ct. 3218, 3227, 177 L.Ed.2d 792 (2010). The claimed data processing system at issue here does not incorporate a machine into the claim in a manner that would constitute insignificant pre- or post-solution activity. These claims are to a system of tangible machine components with limited specialized functions programmed consistent with detailed algorithms disclosed in the patent. How can this system, with its first party device, data storage unit, second party device, computer, and communications controller, be an "abstract idea"? Although these claims could certainly be challenged under § 102 or § 103 or even § 112, no contortion of the term "abstract idea" can morph this physical system into an abstract idea.

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[1] If all of the claims of these four patents are ineligible, so too are the 320,799 patents which were granted from 1998-2011 in the technology area "Electrical Computers, Digital Processing Systems, Information Security, Error/Fault Handling." *See* U.S. Patent & Trademark Office, Selected Technology Report, *available at* http://www.uspto.gov/web/offices/ac/ido/oeip/taf/ec_dps_is_efh.htm. Every patent in this technology category covers inventions directed to computer software or to hardware that implements software. In 2011 alone, 42,235 patents were granted in this area. *Id.* This would render ineligible nearly 20% of all the patents that actually issued in 2011. If the reasoning of Judge Lourie's opinion were adopted, it would decimate the electronics and software industries. There are, of course, software, financial system, business method and telecom patents in other technology classes which would also be at risk. So this is quite frankly a low estimate. There has never been a case which could do more damage to the patent system than this one.

Our court is irreconcilably fractured over these system claims and there are many similar cases pending before our court and the district courts. It has been a very long time indeed since the Supreme Court has taken a case which contains patent eligible claims. This case presents the opportunity for the Supreme Court to distinguish between claims that *are* and *are not* directed to patentable subject matter. For the reasons explained herein, I write separately to explain why the system claims at issue are directed to patent eligible subject matter.

I.

Although the Supreme Court's recent decisions in *Prometheus* and *Bilski* do not address system claims, they certainly provide guidance on the abstract idea exception. In *Bilski*, the Court held that claims directed to a method of hedging risk in the energy market were not patent-eligible because they covered no more than an abstract idea. 130 S.Ct. at 3231. The Court held that while the machine-or-transformation test is not the "sole test" for deciding whether an invention is patent eligible, it "is a useful and important clue." *Id.* at 3227. *Bilski* makes clear the Court's view that a method claim may be patent-eligible under § 101 *even if* it is not tied in any way to a machine. *Id.* The Court reasoned that requiring a machine tie would risk stifling innovation by "creat[ing] uncertainty as to the patentability of software, advanced diagnostic medicine techniques, and inventions based on linear programming, data compression, and the manipulation of digital signals." *Id.*

Although the Court held that a machine tie is not *necessary*, it explained that a method claim's recitation of machine limitations is a "useful and important clue" that the claim is patent-eligible. *Id.* This is because incorporating machine elements, such as computer hardware, helps to limit the claim to a practical application of any underlying idea. It is true that, if the machine is mere insignificant post-solution activity or data gathering antecedent to performance of a claimed method, then its incorporation into a claim to an otherwise patent-ineligible abstract idea would not be sufficient to avoid the abstract idea exception to patent-eligibility. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, — U.S. —, 132 S.Ct. 1289, 1301, 182 L.Ed.2d 321 (2012); *Bilski*, 130 S.Ct. at 3231. But if meaningfully tying a method to a machine can be an important indication of patent-eligibility, how can a claim to the *machine itself*, with all its structural and functional limitations, *not* be patent-eligible?

In *Prometheus*, the Court held that claims directed to a method of optimizing therapeutic efficacy of a drug were not patent-eligible. *Prometheus*, 132 S.Ct. at 1305. The Court, however, also cautioned that "too broad an interpretation" of the abstract idea exception to § 101 "could eviscerate patent law" because "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Id.* at 1293. The Court thus reiterated the rule from *Diehr* that, although an abstract idea itself is not patent-eligible, "an application of a law of nature or mathematical formula to a *known structure* or process may well be deserving of patent protection." *Id.* at 1293-94. This distinction between an abstract idea and its application reflects a delicate balance between promoting innovation through patents and preventing monopolization of the basic tools of scientific and technological work. *Id.* at 1293, 1301-02. The key question is thus whether a claim recites a sufficiently concrete and practical application of an abstract idea to qualify as patent-eligible.

Prometheus instructs us to answer this question by determining whether a process involving a natural law or abstract idea also contains an "inventive concept," which it defined as "other elements or a combination of elements . . . sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself." *Id.* at 1294. The Court reiterated that the "inventive concept" must be something more than limiting the invention to a particular technological environment or adding data-gathering steps or other insignificant post-solution activity. *Id.* at 1294, 1299. In other words, "one must do more than simply state the law of nature while adding the words 'apply it.'" *Id.* at 1294. This language is a reminder of the long-understood principle that adding insignificant pre- or post-solution activity to an abstract idea does not make the claim any less abstract. *See, e.g.*, *Diehr*, 450 U.S. at 191-92, 101 S.Ct. 1048 ("[I]nsignificant post-solution activity will not transform an unpatentable principle into a patentable process."); *Parker v. Flook*, 437 U.S. 584, 590, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance.").

My colleagues erroneously apply *Prometheus*'s "inventive concept" language by stripping away all known elements from the asserted system claims and analyzing only whether what remains, as opposed to the claim as a whole, is an abstract idea. *See* Lourie Op. at 1290-91. From this flawed analysis, they conclude that "the system claims are little different" from the asserted method claims. Lourie Op. at 1290. This approach is inconsistent with the 1952 Patent Act, and years of Supreme Court, CCPA, and Federal Circuit precedent that abolished the "heart of the invention" analysis for patentability.

Moreover, my colleagues' analysis imbues the § 101 inquiry with a time-dependency that is more appropriately the province of §§ 102 and 103. It is true that the analyses of patent-eligibility under § 101 and novelty under § 102 may sometimes overlap. *See Prometheus*, 132 S.Ct. at 1304. But § 101 is not a moving target—claims should not become abstract simply through the passage of time. Under my colleagues' approach, however, a system claim that passes § 101 when the patent issues could later magically transform into an abstract idea simply because certain computer hardware elements no longer seem inventive.

Bilski and *Prometheus* follow on a long line of Supreme Court cases that distinguish between machine claims and method claims on the basis that a machine covers an *application* of any underlying idea rather than the idea itself. For example, although a claim's statutory class is not dispositive of the § 101 inquiry, the Supreme Court explained in *Burr v. Duryee* that a machine is a concrete thing, not an idea:

> *A machine is a concrete thing, consisting of parts*, or of certain devices and combinations of devices. The principle of a machine is properly defined to be 'its mode of operations,' or that peculiar combination of devices which distinguish it from other machines. *A machine is not a principle or an idea*.

68 U.S. (1 Wall.) 531, 570, 17 L.Ed. 650 (1863) (emphases added). The Court explained that, "[b]ecause the law requires a patentee to explain the mode of operation of his peculiar machine, which distinguishes it from others, it does not authorize a patent for a 'mode of operations as exhibited in a machine.'" *Id.* In other words, the requirement of specifying the particular limitations and structure of a claimed machine meaningfully limits the claim, such that it amounts to more than the principle or idea that it embodies. The Court later reiterated this distinction, stating that "[a] machine is a thing. A process is an act, or a mode of acting. The one is visible to the eye,—an object of perpetual observation. The other is a conception of the mind, seen only by its effects when being executed or performed." *Expanded Metal Co. v. Bradford*, 214 U.S. 366, 384, 29 S.Ct. 652, 53 L.Ed. 1034 (1909) (quoting *Tilghman v. Proctor*, 102 U.S. 707, 728, 26 L.Ed. 279 (1880)).

Our court, sitting en banc, applied these principles to hold patent-eligible a claim that would read on a general purpose computer programmed to carry out the operations recited in the claim. *In re Alappat*, 33 F.3d 1526, 1545 (Fed.Cir.1994) (en banc). We stated that, although many of the means-plus-function elements recited in the only asserted independent claim represent circuitry elements that perform mathematical calculations, "the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine" for performing the invention's anti-aliasing technique. *Id.* at 1544. We explained that "[t]his is not a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine." *Id.* The patent applicant admitted that its claim "would read on a general purpose computer programmed to carry out the claimed invention." *Id.* at 1545. We nonetheless held that the claim was patent-eligible under § 101, explaining that "such programming *creates a new machine*, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *Id.* (emphasis added). Judge Lourie's opinion completely repudiates Judge Rich's approach in *Alappat*. The two are not reconcilable.

The Supreme Court has never cast doubt on the patentability of claims such as those at issue in *In re Alappat* or the system claims at issue in this case. Indeed, *Alappat*'s reasoning is completely consistent with *Bilski*, *Prometheus*, and the Supreme Court's other § 101 cases. Unlike a claim reciting a method and simply saying "apply it" on a general purpose computer, a system claim's structural limitations restrict the claimed machine by requiring certain physical components. These concrete elements are precisely the sort of "inventive concept" that meaningfully limits the claim, preventing it from "tying up" the underlying abstract idea itself. Although the individual components themselves may not be new or innovative, the particular *combination* of components recited in the claim results in a brand new machine—a special purpose computer. *Id.*

Some simple examples illustrate these principles. Even though the concept of addition is an abstract idea, the first calculator that could perform addition was a patent-eligible machine under § 101. If someone subsequently discovered that, by rewiring the calculator, it could perform addition *and* subtraction (both abstract mathematical concepts), the improved calculator would similarly be patent-eligible. The act of modifying the circuitry of a known device such that it is configured to apply an abstract idea does not transform it *into* an abstract idea. If the subsequent inventor were able to reprogram the calculator to perform subtraction (rather than rewire it), it would still be directed to patent-eligible subject matter. That is what software does—it effectively rewires a computer, making it a special purpose device capable of performing operations it was not previously able to perform. Both the software and the computer running the software are patentable subject matter and should pass through the § 101 gate.

The parties in this case agree that if someone sought to patent a general purpose computer, it would satisfy § 101 (although it may fail § 102 or § 103). Why, then, would claiming the same computer with specific programming (thus creating a special purpose computer), transform a patent-eligible machine into a patent-ineligible abstract idea? A claim to a computer running particular software is no less a claim to a computer.

None of this is to suggest that system claims may never be abstract, or that merely adding a computer to a method step can transform a patent-ineligible claim into one that satisfies § 101. But a claim to a structurally defined machine is more than a method claim rewritten in system form. It is a practical application of the underlying idea, limited to the specific hardware recited and the algorithms disclosed to perform the recited functions.

III.

The only way to determine if Alice's asserted system claims are merely directed to an abstract idea is to analyze each claim as a whole, looking at the language of the claims. Claim 1 of the '375 patent, for example, recites:

> *A data processing system* to enable the exchange of an obligation between parties, the system comprising:
>
> *a first party device*,
>
> *a data storage unit* having stored therein
>
> > (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and
> >
> > (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution;
>
> and *a computer*, coupled to said data storage unit, that is configured to
>
> > (a) *receive a transaction from said first party device*;
> >
> > (b) *electronically adjust* said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first

> account and/or said third account, respectively; and
>
> (c) *generate an instruction* to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

'375 patent claim 1 (emphases added).

The claimed data processing system recites three structural components: a computer, a first party device, and a data storage device. The specification describes the invention: the "core of the system hardware is a collection of data processing units." '375 patent col.7 ll.22-23. Each processing unit is operably connected to one or more mass data storage units. *Id.* col.7 ll.39-43.

The claimed data processing system is further limited to one that is configured to perform certain functions in a particular fashion: "receive a transaction from said first party device," "electronically adjust" the parties' accounts, and "generate an instruction." The specification discloses numerous flow diagrams in Figures 8-16 and 18-40 that provide algorithm support for the software that performs these functions. '375 patent col.7 ll.29-33. The "flow charts in FIGS. 8 to 16 depict the processing flow of the matching system for primary product orders submitted by ordering party stakeholders. . . ." *Id.* col.16 ll.42-44. More specifically, Figures 11-15 provide an explanation of the process through which counterparties are matched ("order matching"). *Id.* col.17 ll.55-56. Figure 15 depicts the process of identifying a potential counterparty from a short list, and is a useful example of the level of detail that the specification provides regarding the claimed functions:

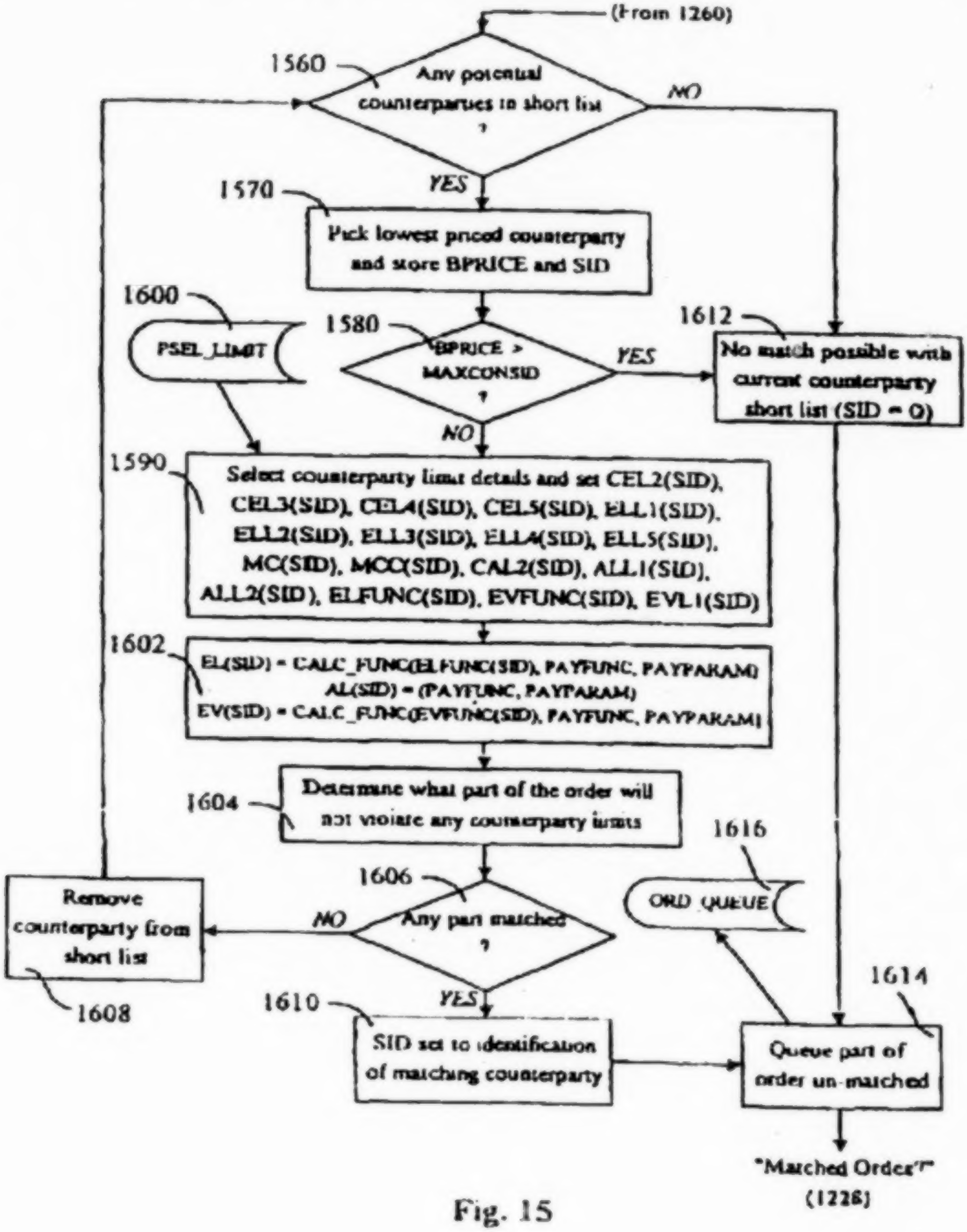
(From 1260)
1560
Any potential counterparties in short list ?
NO
YES
1570
Pick lowest priced counterparty and store BPRICE and SID
1600
PSEL_LIMIT
1580
BPRICE > MAXCONSID ?
YES
1612
No match possible with current counterparty short list (SID = 0)
NO
1590
Select counterparty limit details and set CEL2(SID), CEL3(SID), CEL4(SID), CEL5(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), MC(SID), MCC(SID), CAL2(SID), ALL1(SID), ALL2(SID), ELFUNC(SID), EVFUNC(SID), EVL1(SID)
1602
EL(SID) = CALC_FUNC(ELFUNC(SID), PAYFUNC, PAYPARAM)
AL(SID) = (PAYFUNC, PAYPARAM)
EV(SID) = CALC_FUNC(EVFUNC(SID), PAYFUNC, PAYPARAM)
1604
Determine what part of the order will not violate any counterparty limits
1616
1606
Remove counterparty from short list
NO
Any part matched ?
ORD_QUEUE
1614
1608
1610
YES
SID set to identification of matching counterparty
Queue part of order un-matched
"Matched Order?"
(1228)

Fig. 15

The specification explains that this algorithm includes the steps of checking to make sure the counterparty short list is not empty and, if it is not, identifying the lowest priced counterparty on the short list. '375 patent col.19 ll.55-63. This corresponds to blocks 1560 and 1570 in Figure 15. The system does this based on the counterparty's bid price (PRICE (SID)). *Id.* col.19 l.63-col.20 l.2. The system rejects matches in which the counterparty's bid price is greater than the ordering party's maximum price (block 1612). *Id.* col.20 ll.8-11. The system then checks the order against all of the applicable limits and calculates the portion of the order which will not violate the counterparty limits (blocks 1590, 1602, 1604, and 1606). *Id.* col.20 ll.18-37. If some portion of the order is matched, the system notes the identification of the matching counterparty and confirms the matched order using the process detailed in Figure 16 (the "matched order confirmation" process). *Id.* col.20 ll.41-49. The process depicted in Figure 15 and described in the specification is just one of the processes included in the claim element "receive a transaction from said first party device."

Looking at these hardware and software elements, it is impossible to conclude that this claim is merely an abstract idea. It is a pure system claim, directed to a specific machine configured to perform certain functions. Indeed, the computer covered by this claim is a tangible item that you could pick up and put on your desk. It is *not* a method claim simply disguised as a machine claim, nor does it incorporate the computer elements in an insignificant way. The asserted data processing systems claimed in the '720 and '375 patents recite additional structural limitations (including a second party device and a communications controller). And the dependent claims (which are also asserted and must be analyzed individually) limit the computer system even further. Some recite a "means for allowing said first party to acquire an item from said second party, wherein the exchange obligation relates to said item." *See, e.g.*, '375 patent claims 11, 24, and 36; *see also* '720 patent claims 27, 59, 67, 79, and 84. These claims expressly cover only the algorithm disclosed as a means for performing the acquisition, or equivalents thereof. *See, e.g.*, *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed.Cir.2008). Judge Lourie's opinion does not individually analyze any of these claims. If these claims do not clear the § 101 hurdle, then the abstract idea exception will be an insurmountable bar for innovators of software, financial systems and business methods, as well as for those in the telecommunications field. Every software patent makes a computer perform different functions—that is the purpose of software. Each software program creates a special purpose machine, a machine which did not previously exist (assuming the software is novel). The machine ceases to be a general purpose computer when it is running the software. It does not, however, by virtue of the software it is running, become an abstract idea.

It bears repeating that the computer limitations in these claims are not insignificant pre- or post-solution activity. Nor does this conclusion "exalt form over substance" or allow the "draftsman's art" to dictate patent-eligibility. *Prometheus*, 132 S.Ct. at 1294. These are not just method claims masquerading as system claims—they are detailed, specific claims to a system of particular hardware programmed to perform particular functions. The computer in the system claims is the entire detailed "solution," without which it would be impossible to achieve the invention's purpose. The *Bilski* court explained that substantial machine limitations would be a "useful and important clue" that method claims are patent-eligible. *See Bilski*, 130 S.Ct. at 3227. These claims are far more limited. They cover the machine *itself*; the machine *is* the invention.

It is important to remember that, regardless of whether we hold these claims to be *patent-eligible*, they may well fail to meet the other requirements for patent protection. Taking a known or abstract idea and simply putting it on a computer is likely not entitled to patent protection. Section 102's novelty or § 103's nonobviousness requirements are the means to challenge a system claim that does no more than take a familiar, well known concept and put it on a computer. Or, if the claim is to a machine whose precise structure or method of operation is not sufficiently detailed (think perpetual motion machine), then § 112 would prevent patentability. When you walk up to the § 101 gate holding a computer in your arms (or software for that matter), you should not be rejected because your computer is an abstract idea.

For the reasons given above, I believe that Alice's asserted system claims are patent-eligible under § 101. I would thus reverse the district court's judgment with respect to those claims.

Concurring-in-part and dissenting-in-part opinion filed by NEWMAN, Circuit Judge.

NEWMAN, Circuit Judge, concurring in part, dissenting in part.

The ascendance of section 101 as an independent source of litigation, separate from the merits of patentability, is a new uncertainty for inventors. The court, now rehearing this case en banc, hoped to ameliorate this uncertainty by providing objective standards for section 101 patent-eligibility. Instead we have propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation. With today's judicial deadlock, the only assurance is that any successful innovation is likely to be challenged in opportunistic litigation, whose result will depend on the random selection of the panel.

Reliable application of legal principles underlies the economic incentive purpose of patent law, in turn implementing the benefits to the public of technology-based advances, and the benefits to the nation of industrial activity, employment, and economic growth. Today's irresolution concerning section 101 affects not only this court and the trial courts, but also the PTO examiners and agency tribunals, and all who invent and invest in new technology. The uncertainty of administrative and judicial outcome and the high cost of resolution are a disincentive to both innovators and competitors.

I

TODAY'S IMPASSE

In deciding to rehear the patent dispute between CLS Bank and Alice Corporation, the en banc court undertook to remedy distortions flowing from inconsistent precedent on section 101. This remedial effort has failed. This failure undoubtedly reflects the difficulty of the question; I suggest that it also demonstrates that an all-purpose bright-line rule for the threshold portal of section 101 is as unavailable as it is unnecessary. Experience over two centuries of United States patent law supports this conclusion.

Section 101 is not the appropriate vehicle for determining whether a particular technical advance is patentable; that determination is made in accordance with the rigorous legal criteria of patentability. Contrary to the diverse protocols offered by my colleagues, it is not necessary, or appropriate, to decide whether subject matter is patentable in order to decide whether it is eligible to be considered for patentability.

This section 101 issue appears to have its foundation in a misunderstanding of patent policy, for the debate about patent eligibility under section 101 swirls about concern for the public's right to study the scientific and technologic knowledge contained in patents. The premise of the debate is incorrect, for patented information is not barred from further study and experimentation in order to understand and build upon the knowledge disclosed in the patent.

Judicial clarification is urgently needed to restore the understanding that patented knowledge is not barred from investigation and research. The debate involving section 101 would fade away, on clarification of the right to study and experiment with the knowledge disclosed in patents.

These issues have arisen in connection with today's newest fields of science and technology; that is, computer-based and related advances, and advances in the biological sciences. These fields have spawned today's dominant industries, and produced spectacular benefits. I have seen no competent analysis of how these technologies and industries would be affected by a fundamental reduction in patent-eligibility. Dramatic innovations, and public and economic benefits, have been achieved under the patent law as it has existed.

Thus I write separately to propose that the court resolve the present impasse by returning to the time-tested principles of patent law. I propose that the court reaffirm three basic principles relating to section 101, as follows:

> 1. *The court should hold that section 101 is an inclusive statement of patent-eligible subject matter*— I propose that the court reaffirm that patent-eligible subject matter is as stated in the patent statute. The court should acknowledge the statutory purpose of section 101, to provide an inclusive listing of the "useful arts." Then, upon crossing this threshold into the patent system, examination of the particular subject matter on the substantive criteria of patentability will eliminate claims that are "abstract" or "pre-emptive," on application of the laws of novelty, utility, prior art, obviousness, description, enablement, and specificity. There is no need for an all-purpose definition of "abstractness" or "preemption," as heroically attempted today.
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> 2. *The court should hold that the form of the claim does not determine section 101 eligibility*— I propose that the court make clear that patent eligibility does not depend on the form of the claim, whether computer-implemented innovations are claimed as a method or a system or a storage medium, whether implemented in hardware or software. Patent eligibility does not turn on the ingenuity of the draftsman. The differences among my colleagues' views of this aspect simply add to the instability and uncertainty of patenting and enforcement.
>
> 3. *The court should confirm that experimental use of patented information is not barred—*

> Misunderstanding of this principle appears to be the impetus for the current debate, for the popular press, and others who know better, have stated that patented subject matter cannot be further studied. This theory is presented to support section 101 ineligibility, on the reasoning that important discoveries should be ineligible for patenting so that they can be further studied. I propose that the court reaffirm the long-standing rule that study and experimentation are not infringement, whether the experimentation is for basic or applied purposes.

On adoption of these principles the law of section 101 will be stabilized, and patentability can continue to be determined in accordance with statute and precedent.

II

EXPERIMENTAL USE OF PATENTED INFORMATION

I start with this issue, for the misperception that study of patented subject matter is precluded, has placed a misdirected spin on section 101.

The idea that experimentation with patented information is restricted is the basis of the view that patenting inhibits scientific advance. For example, the Court stated in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, — U.S. —, 132 S.Ct. 1289, 1301, 182 L.Ed.2d 321 (2012) that "there is a danger that the grant of patents that tie up their use will inhibit future innovation premised upon them, a danger that becomes acute when a patented process amounts to no more than an instruction to 'apply the natural law,' or otherwise forecloses more future invention than the underlying discovery could reasonably justify."

However, the Court has recognized that "[t]he federal patent system thus embodies a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and unobvious advances in technology and design in return for the exclusive right to practice the invention for a period of years." *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 150-51, 109 S.Ct. 971, 103 L.Ed.2d 118 (1989). *See J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 142, 122 S.Ct. 593, 151 L.Ed.2d 508 (2001) ("The disclosure required by the Patent Act is 'the quid pro quo of the right to exclude.'"); *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 484, 94 S.Ct. 1879, 40 L.Ed.2d 315 (1974) (same).

This disclosure is available to produce further advance, on further study and experimentation. The Court long ago recognized that the scientific and technological information in patents may be studied, evaluated, tested, improved upon, compared, etc., as explained by Justice Story in *Whittemore v. Cutter*:

> It could never have been the intention of the legislature to punish a man, who constructed such a machine merely for philosophical[1] experiments, or for the purpose of ascertaining the sufficiency of the machine to produce its described effects.

29 F. Cas. 1120, 1121 (C.C.D.Mass.1813). The Court reiterated this principle in *Graham v. John Deere Co.*,

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[1] "Philosophical" means "scientific" in the language of that era. *Integra Lifesciences I, Ltd. v. Merck KGaA*, 331 F.3d 860, 874-75 n. 8 (Fed.Cir.2003) (Newman, J., dissenting).

referring to the "inherent requisites in a patent system":

> Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which by constitutional command must "Promote the Progress of . . . useful Arts." This is the standard expressed in the Constitution and it may not be ignored.

383 U.S. 1, 6, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966) (ellipses in original). The reference to "useful knowledge" cannot mean that the knowledge disclosed in patents is untouchable for seventeen years.

The Federal Circuit has reaffirmed that "patenting does not deprive the public of the right to experiment with and improve upon the patented subject matter." *In re Rosuvastatin Calcium Patent Litig.*, 703 F.3d 511, 527 (Fed.Cir.2012). However, in *Embrex, Inc. v. Service Engineering Corp.*, 216 F.3d 1343, 1349 (Fed.Cir.2000), the court stated that the experimental use defense was "very narrow" and unavailable when "the inquiry has definite, cognizable, and not insubstantial commercial purpose," the concurrence adding that "neither the statute nor any past Supreme Court precedent gives any reason to excuse infringement because it was committed with a particular purpose or intent, such as for scientific experimentation," *id.* at 1353. Precedent does not support this theory.

The right to study and experiment, to evaluate and improve upon the information in patents was discussed by our predecessor Court of Claims in *Ordnance Engineering Corp. v. United States*, 84 Ct.Cl. 1 (1936) and in *Chesterfield v. United States*, 159 F.Supp. 371 (Ct.Cl.1958), the court explaining that experimentation does not infringe the patent. Factual distinctions may arise, as in *Pitcairn v. United States*, 212 Ct.Cl. 168, 547 F.2d 1106 (1976), where the Court of Claims held that of 2200 infringing helicopters, the use of 93 helicopters for testing or demonstration was not an "experimental use," as compared with the truly "experimental helicopters" that the patentee did not accuse of infringement.

Scholars have explained this essential policy of patent systems, whereby patented information adds to the body of knowledge, and the right to exclude does not prohibit further study of patented technology. *See* Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. Chi. L.Rev. 1017, 1022 (1989):

> If the public had absolutely no right to use the disclosure without the patent holder's consent until after the patent expired, it would make little sense to require that the disclosure be made freely available to the public at the outset of the patent term. The fact that the patent statute so plainly facilitates unauthorized uses of the invention while the patent is in effect suggests that some such uses are to be permitted.

See Janice M. Mueller, *The Evanescent Experimental Use Exemption from United States Patent Infringement Liability: Implications for University and Nonprofit Research and Development*, 56 Baylor L.Rev. 917, 921 (2004):

> The publication of information about a new invention in the form of an issued patent is of little use to society if that information is effectively kept 'on ice' for seventeen-eighteen years by means of a

> patent owner's unchecked right to exclude others from use for any purpose.

See also Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 Wis. L.Rev. 81 (2004) (distinguishing between infringing and non-infringing uses of information disclosed in patents, by differentiating between permissible "experimenting on" patented inventions, and impermissible "experimenting with" things that are patented); Andrew S. Baluch, *Relating the Two Experimental Uses in Patent Law: Inventor's Negation and Infringer's Defense*, 87 B.U. L.Rev. 213 (2007) (proposing that the right of experimental use by others balances the experimental use exception to § 102(b)).

Patents do not prevent experimentation with patented subject matter, whether the purpose is scientific knowledge or commercial potential. To hold otherwise would be to deny a foundation of the system of patents. However, the popular press has accepted the theory that experimentation is barred for patented subject matter,[2] as have my colleagues, who cite that position as grounds for restricting eligibility under section 101.[3]

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[2] *See, e.g.*, Adam Liptak, *Supreme Court to Look at a Gene Issue*, N.Y. Times, Nov. 30, 2012 ("Myriad and other gene patent holders have gained the right to exclude the rest of the scientific community from examining the naturally occurring genes of every person in the United States"); Michael Specter, *Can We Patent Life?*, The New Yorker, April 2, 2013 ("Any scientist who wants to conduct research on such a gene—even on a small sequence of its DNA—has to pay license fees.").

[3] *See* Lourie Op. at 1281 ("Guarding against the wholesale preemption of fundamental principles should be our primary aim in applying the common law exceptions to § 101."); Rader Op. at

The patent statute requires that the patented information is made known ("patent" is derived from the latin "patere," which means "to lie open"), and that the patentee provide details of how to make and use the patented subject matter. In return, the patentee receives a term of exclusivity that has traditionally been applied only against commercial practice. On this simple bargain the industrial age blossomed, built on improvements and advances in patented subject matter.

Judicial precedent is sparse on the issue of experimental use, for until recently the principle was not in question. Technical publications often describe research in patent-heavy fields, apparently without fear of lawsuits. At a recent conference reported in the Patent, Trademark, & Copyright Journal, a spokesman stated that "research has been spurred rather than inhibited as a result of the [Myriad] patents, citing 18,000 researchers who have published over 10,000 articles. . . ." 85 PTCJ 759 (2013).

In summary, experimental use of patented information can take various forms, including:

a. *experiments to improve or build upon patented subject matter*— Such studies are encouraged by the patent system; it has never been the law that such experimentation is infringement.

b. *experiments to compare patented subject matter with alternatives to determine relative performance and properties*— Improvements would be inhibited if new developments could not be

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1300 n. 3 (permissible experimentation is limited to "academic research" "without commercial ends").

compared with the old. Such a position has never been the law.

c. *experimental study of patented subject matter to understand its mechanism*— Such scientific study is an important attribute of patent systems. Scientific understanding may or may not lead to new commercial embodiments, which are not excused from infringement if covered by valid claims; but study of patented subject matter is not infringement.

d. *experimental study of patented subject matter to find new applications or modifications*— Such new directions are a benefit of the patent system; the experimentation is not infringement.

The courts, the press, and the public, have been led down a path that is contrary to patent principles. Let us remove the doubts we have sown. With clarification of the right to experiment with the information disclosed in patents, it will no longer be necessary to resort to the gambit of treating such information as an "abstraction" in order to liberate the subject matter for experimentation, whether for scientific or commercial purposes. I respectfully dissent from the contrary majority position.

III

"ABSTRACTION" IN COMPUTER-BASED PATENTS

I turn briefly to the concept of "abstraction" in connection with section 101 eligibility of computer-implemented subject matter. In the case before us, the diverse theories of the role of section 101, presented by the parties and the many *amici curiae*, show not only the complexity but also the importance of the issue.

However, it is not necessary to rewrite the law of patent eligibility.

All scientific and technologic advance starts with fundamental principles, described by my colleagues as "abstract ideas," although the Court has recognized that "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Mayo*, 132 S.Ct. at 1293. Scientific principles are "a creation of the human mind, with its freely invented ideas and concepts,"[4] while the adaptation of such principles to public benefit is the milieu of patents. The Court explained in *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94, 59 S.Ct. 427, 83 L.Ed. 506 (1939) that "While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."

My colleagues today attempt to devise universal criteria of eligibility under section 101. Some colleagues rely on "abstraction;" while others invoke "preemption;" others look for "meaningful" limitations. I quite agree that it is not easy to define "abstraction" or "preemption" or "meaningful limitation," yet my colleagues propose that these terms bar the gateway to the patent system. Such definition is as elusive for Alice Corporation's escrow banking system as for the most complex of phenomena:

> The intrinsic uncertainty of the meaning of words was of course recognized very early and has brought about the need for definitions, or—as the word "definition" says—for the setting of

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[4] Albert Einstein & Leopold Infeld, *The Evolution of Physics* 310 (1938).

> boundaries that determine where the word is to be used and where not to. But definitions can be given only with the help of other concepts, and so one will finally have to rely on some concepts that are taken as they are, unanalyzed and undefined.

Werner Heisenberg, *Physics and Philos*ophy 168 (1958).

I propose that the court return to the statute, and hold that when the subject matter is within the statutory classes in section 101, eligibility is established. This conforms with legislative intent. *See Diamond v. Chakrabarty*, 447 U.S. 303, 308, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980) ("In choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope."). The Court in *Diamond v. Diehr*, 450 U.S. 175, 182, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981), reiterated that the system of patents embraces "anything under the sun that is made by man"; it cannot be that computer-implemented developments may or may not be eligible under section 101 depending on how broadly they are sought to be claimed. Breadth of claiming, and undue breadth, are determined under sections 102, 103, and 112, not section 101.

The Court in *J.E.M. v. Pioneer* recognized that section 101 is a general and "dynamic provision designed to encompass new and unforeseen inventions." 534 U.S. at 135, 122 S.Ct. 593. In its study of "A Patent System for the 21st Century" (2004) the National Research Council focused on the emerging technologies in a "Knowledge-Based Economy," and observed that the patent system is "a unitary system with few *a priori* exclusions." *Id.* at 57. It is beyond cavil that the patent system is intended to be receptive to the advances of science and technology.

This court referred to section 101 as a "coarse filter," *see Research Corporation Technologies, Inc. v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed.Cir.2010). On traversing the coarse filter, the subject matter is subjected to the statutory rigors of novelty, unobviousness, enablement, specificity, etc. This approach places inventions in the statutory framework of patentability, not merely eligibility to be considered for participation in the patent incentive system.

No substitute has been devised for the incentive of profit opportunity through market exclusivity.[5] The court should return to these basic principles, and abandon its failed section 101 ventures into abstraction, preemption, and meaningfulness.

I repeat my concern for the court's preservation of legal uncertainty through our inconclusive treatment of the law of section 101. The escrow banking mechanism of the patents in suit is claimed in the Alice Corporation patents as a method or a system or a media device. The form of the claim does not determine section 101 patent eligibility. Nor does the scope of the claim. In claim drafting, it is customary to start with broad claims and then draft claims of progressively narrower scope; this does not determine "abstraction" under section 101. As in *O'Reilly v. Morse*, 56 U.S. 62, 15 How. 62, 14 L.Ed. 601 (1853), Samuel Morse's broadest claim was rejected for undue breadth because it was directed to "the use of the motive power of the electric or galvanic current . . . for making or printing intelligible characters, letters or signs, at any distances," *id.* at 86; the Court did not discuss "eligibility," but simply held that this claim was not limited to the "specific machinery" described in the specification, and was unduly broad.

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[5] Illustration is seen in the Orphan Drug Act, 21 U.S.C. § 360aa-360ee (1997), which provides patent-like exclusivity and is reported to have provided treatment for many previously untreated diseases. Food & Drug Admin., *Developing Products for Rare Diseases & Conditions*, http://www.fda.gov/ForIndustry/DevelopingProducts forRareDiseasesConditi/default.htm ("The [Orphan Drug] program has successfully enabled the development and marketing of more than 400 drugs and biologic products for rare diseases since 1983. In contrast, fewer than 10 such products supported by industry came to market between 1973 and 1983."). And the experience of the Bayh-Dole Act is that patent exclusivity has moved much university research into public benefit. *See* Wendy H. Schacht, Cong. Research Serv., RL 32076, *The Bayh-Dole Act: Selected Issues in Patent Policy and the Commercialization of Technology* 7 (2005).

I share the majority view that all of the claims stand or fall together. I would hold that the system, the method, and the media claims are eligible under section 101, and would remand to the district court for determination of patentability under the substantive provisions of the statute.

Dissenting opinion filed by LINN and O'MALLEY, Circuit Judges.

LINN and O'MALLEY, Circuit Judges, dissenting from the Court's judgment.

The method, media, and system claims we review today must rise and fall together; either they are all patent eligible or they are not. This is so, not because, as Judge Lourie's opinion concludes, they are all tainted by reference to the same abstract concept, but because the record we are presented makes clear that they are grounded by the same meaningful limitations that render them patent eligible. Thus, we believe the analysis of the method claims conducted by Chief Judge Rader and Judge Moore in Part VI of our collective opinion[1] and Parts III.A and III.B of Judge Lourie's opinion suffer from the same flaw: they are divorced from the record to which we are bound. We write to address that flaw.

I

We begin with a careful assessment of the record and procedural posture presented in this case. This appeal arises from a grant of summary judgment in favor of Plaintiff-Appellee CLS Bank International ("CLS"), dismissing the action with prejudice on grounds that none of the asserted claims of U.S. Patent Nos. 5,970,479 ("the '479 patent"), 6,912,510 ("the '510 patent"), 7,149,720 ("the '720 patent"), and 7,725,375 ("the '375 patent") recite patentable subject matter. The summary judgment process occurred prior to construction of the asserted claims and their attendant limitations. Indeed, the court considered and granted CLS's summary judgment motion before ever conducting a hearing pursuant to *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), and even before briefing on claim construction. As such, no determination has ever been made regarding how one of skill in the art would understand the claims as of the date of issuance. And, no careful assessment of the intrinsic record or prosecution history has ever occurred; much of this was never even made a part of the trial record.

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[1] We cite to Parts I-V and VII of our collective opinion as the "Rader/Linn/Moore/O'Malley Op.;" we refer to Part VI of that opinion, which is authored by Chief Judge Rader and Judge Moore only, as the "Rader/Moore Op."

As the trial court recognized, the only way to avoid these predicate steps before granting summary judgment was for the court to construe the claims as defendant-appellant Alice Corporation ("Alice") would have it do. The trial court was, thus, required to read into the claims whatever limitations Alice asserted a skilled artisan would assume they possessed. Similarly recognizing the procedural posture in which it asked the trial court to rule, "CLS agreed to assume a construction of claims favorable to Alice." *CLS Bank Int'l v. Alice Corp.*, 768 F.Supp.2d 221, 236 n. 6 (D.D.C.2011). The trial court did so; it concluded that, "because the relevant terms of claims 33 and 34 of the '479 Patent have yet to be construed, because CLS has agreed to a broad construction[2] of terms favorable to Alice, and because the specification reveals a computer-based invention, the Court can reasonably assume for present purposes that the terms 'shadow' credit and/or debit record and 'transaction' in the '479 Patent recite electronic implementation and a computer or an analogous electronic device." *Id.* at 236 (footnote added).

We must look then to the construction posited by Alice at the summary judgment stage to understand the claims before us. It is undisputed that Alice claimed that "the entirety of Alice's method [as recited in the '479 and '510 patents]—including the 'adjusting' step that effectuates the claimed exchange of obligations—must be performed electronically using a computer and memory." Memorandum in Support of Alice Corp. Pty. Ltd.'s Renewed Cross-Motion for Summary Judgment as to Patent Eligibility & in Opposition to CLS's Motion for Summary Judgment at 41, *CLS Bank Int'l v. Alice Corp.*, 768 F.Supp.2d 221 (D.D.C.2011) (No. 1:07-cv-974), ECF No. 95 [hereinafter "Alice's Summ. J. Br."]. Specifically, Alice argued that a skilled artisan would appreciate that the method claims necessarily require electronic implementation of each of their steps and that this electronic implementation would occur through a computer. In support of this position, Alice offered an expert declaration by Mr. Paul Ginsberg. *See* Alice Corp. Pty. Ltd.'s Renewed Cross-Motion for Partial Summary Judgment as to Subject Matter Eligibility, Declaration of Stanley E. Fisher, Exhibit 1, Declaration of Paul Ginsberg, *CLS Bank Int'l v. Alice Corp.*, 768 F.Supp.2d 221 (D.D.C.2011) (No. 1:07-cv-974), ECF No. 95-3 [hereinafter "Ginsberg Decl."]. In that declaration, Mr. Ginsberg explained how a person of skill in the art would interpret the method claims upon "reviewing the claims in view of the patent specification (including the description of the subject matter in ¶¶ 25-26 above) and the prosecution history." *Id.* ¶ 29. Based on this record, both CLS and the trial court accepted the fact that the method claims of the '510 and '479 patents recite "an electronic method for performing the settlement, and the 'maintaining,' 'receiving,' 'adjusting,' and 'generating' steps are central to that process." Alice's Summ. J. Br. at 42.

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[2] The trial court misspoke here; CLS conceded to a *narrower* construction—not a broader one. That is, although, on their face, the claims arguably cover all applications of the claimed method, not just electronic applications, i.e., they are broad, CLS agreed to limit those claims to electronic implementations of all aspects of the claimed methods.

CLS has stood by these stipulations and assumptions on appeal. Indeed, it emphatically has done so. In all of its briefing and in its arguments on appeal, CLS has acknowledged that the shadow credit and debit records and the transactions and adjustments between them must be implemented electronically.

Appellee's Principal En Banc Br. 3, 34; Appellee's Reply En Banc Br. 20; Oral Arg. at 11:29, *CLS Bank Int'l v. Alice Corp.*, No. 2011-1301, *available at* http://www.cafc.uscourts.gov/oral-argument-recordings/2011-1301/2013-02-08/all [hereinafter "Oral Arg."]. At oral argument in this en banc proceeding, counsel for CLS confirmed its view that every limitation and electronic process that appears in the system claims must be read into the method claims. Oral Arg. at 11:29-11:55.[3] Thus, counsel for CLS agreed that, given the state of the record we face on appeal, the claims cannot be parsed—they either all are drawn to patentable subject matter, as Alice claims, or none are drawn to patentable subject matter, as CLS claims. Appellee's Principal En Banc Br. 11, 51 ("Here, the Section 101 analysis is equivalent for all of Alice's claims.").

II

Our colleagues ignore the record of the lower court proceedings and the stipulations by which CLS agrees it must be bound. Chief Judge Rader and Judge Moore construe the method claims as far broader than the system claims and assume they are sufficiently different from those system claims to merit different treatment under the Supreme Court's case law governing exceptions to 35 U.S.C. § 101. *See* Rader/Moore Op. at 1312 (construing "each step" of the method claims as "individually recit[ing] merely a general step inherent within the concept of an escrow, using a third party intermediary in this fashion"). Judge Lourie also construes the method claims broadly, but, unlike the Chief Judge and Judge Moore, imports the breadth he reads into the method claims into the system and media claims as well. *See* Lourie Op. at 1286-87, 1288-92. None of those judges explains how the record supports the claim constructions in which they engage, however.

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[3] The following exchange took place during oral argument:

> Judge O'Malley: [Y]ou conceded that . . . the term shadow credit and debit record and transaction all recite electronic implementation ... on a computer or some other electronic device.
>
> And then she [the district judge] later pointed out that even at the *Markman* stage you said that "let's assume that . . . we have to have all of these activities—
>
> Mr. Perry: Correct Your Honor
>
> Judge O'Malley:—implemented through a system on a computer."
>
> Mr. Perry: That's correct Your Honor.

Oral Arg. 11:29-11:55.

Notably, when analyzing the method claims, the Chief Judge and Judge Moore cite to no portion of the written descriptions of the '510 or '479 patents, or to CLS's stipulations regarding claim construction, all the while claiming to rely on "the record." *See* Rader/Moore Op. at 1311 ("The record in this case shows. . . ."); *id.* at 1312 ("Further, the record again shows. . . ."). And, they summarily reject the trial court's assumption that the method claims require the same computer implementation as the system claims. *Id.* at 1312 ("[T]he district court assumed the single fact that the method claims are implemented by computer. Putting to the side whether this construction was correct, even assuming the method claims require use of a computer in some unspecified way, this implicit reference to computer implementation is not, by itself, enough." (citations omitted) (internal quotation marks and ellipsis omitted)). As explained above, however, the actual record establishes that the method claims require more than the use of a computer in some *unspecified* way. CLS has conceded as much and the trial court found as much.

Alice's expert testified that "[s]pecific terms in the claims 33 and 34 [of the '479 patent]," "includ[ing], for example, 'shadow credit record,' 'shadow debit record,' and 'transaction,'" "would be understood by the person of ordinary skill in the art to require that the methods recited in those claims are electronically implemented by a computer coupled to a data storage unit." Ginsberg Decl. ¶ 32. That is, "the particular methods claimed in these patents only work, as intended, when carried out using a computer." *Id.* ¶ 41. Once the trial court chose to proceed on the assumption that computer implementation is required for the method claims, it is the written description—the same written description that informs the system claims—which tells us just what the nature of that computer implementation is.

For this reason, we believe that Chief Judge Rader and Judge Moore's analysis in Part VI of the collective opinion is internally inconsistent with the analysis the four of us employ in Part V of that opinion. Specifically, when analyzing the system claims, we note that "[t]he specification also includes numerous flowcharts that provide algorithm support for the functions recited in the claims." Rader/Linn/Moore/O'Malley Op. at 1307. We also note that "the '375 Patent discloses at least thirty-two figures which provide detailed algorithms for the software with which this hardware is to be programmed." *Id.* at 1307. Relying on the details disclosed in Fig. 16 of the '375 patent, we assert that "[l]abeling this system claim an 'abstract concept' wrenches all meaning from those words, and turns a narrow exception into one which may swallow the expansive rule (and with it much of the investment and innovation in software)." *Id.* at 1309. We do not see how Chief Judge Rader and Judge Moore, when analyzing the method claims, can ignore the fact that the specific functionality described in the figures applies just as much to them as to the system claims. Chief Judge Rader and Judge Moore, in Part V of the collective opinion, acknowledge that the flow charts in the '375 patent depict the algorithms which the software runs—i.e., the subject matter of the method claims. And the same Figure 16 is present in the '479 and '510 patents. In this regard, barring an actual construction of the claims, we must assume the method claims are just as specific as the system claims, and merit the same treatment we afford those latter claims.

Judge Lourie not only divorces his analysis from the record, he turns it on its head. Although Judge Lourie mentions the agreement between the parties and trial court regarding claim construction, *see* Lourie Op. at 1285-86, he ignores the substance of the stipulations and assumptions upon which the proceedings below were predicated—i.e., that the method claims are narrowed by incorporation of all electronic aspects of the system claims, *see id.* at 1286 ("First, the requirement for computer implementation could scarcely be introduced with less specificity; the claim lacks *any* express language to define the computer's participation."). He then takes it upon himself to construe the claims, giving the method claims their broadest possible interpretation in the process. *See id.* at 1286 (construing the method claims such that "[t]here is no specific or limiting recitation of essential or improved computer technology, and no reason to view the computer limitation as anything but insignificant postsolution activity relative to the abstract idea" (citations omitted) (internal quotation marks omitted)); *id.* at 1287 (construing "shadow record" as "reciting no more than the necessary tracking activities of a supervisory institution"). Indeed, Judge Lourie begins, not with the record, or even a proper exercise in claim construction, but with identification of what he finds to be the fundamental concept "wrapped up in the claim." *Id.* at 1282. From there, he searches the words in the claims for "substantive limitations that narrow, confine, or otherwise tie down the claim." *Id.* at 1282. By starting with a paraphrased abstraction of the claims and excluding the record evidence regarding the meaning of the claims, Judge Lourie preordains the method claims ineligible. Judge Lourie then reads into the system claims the same abstraction he felt damned the method claims.

Thus, Judge Lourie explicitly finds that "[t]he computer-based limitations recited in the system claims here cannot support any meaningful distinction from the computer-based limitations that failed to supply an 'inventive concept' to the related method claims." *Id.* at 1290. The "abstraction" he ferrets from his own reading of the method claims, thus, works much like a computer virus to infect his analysis of all of the claims, regardless of their limitations. Indeed, he actually strips the claims of their detail and limitations—in direct contravention of the Supreme Court's admonitions in *Diamond v. Diehr*, 450 U.S. 175, 188, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981)—calling it mere "extravagant language." Lourie Op. at 1286-87.

We do not believe a patent eligibility inquiry can be disembodied from the actual claims at issue, with their attendant limitations. The analytical process in which Judge Lourie engages is at odds with the most basic concepts that govern our patent system. *See* Giles S.

Rich, *Extent of Protection and Interpretation of Claims—American Perspectives*, 21 Int'l Rev. of Indus. Prop. & Copyright L. 497, 499 (1990) ("[T]he name of the game is the claim."); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed.Cir.2005) (en banc) ("It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." (internal quotation marks omitted)). His methodology just cannot be right.

While it may be possible to construe the method claims in such a way that they would read like those in *Bilski v. Kappos*, — U.S. —, 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010), and, thus, be patent ineligible, we see no intellectually sound way to distinguish the method claims *as construed by the district court* from the system claims.

III

We assume our colleagues feel free to ignore the record—or, more appropriately, the lack thereof—in this case because claim construction is a question of law which this court reviews de novo. *See Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456 (Fed.Cir.1998) (en banc). Whether review is de novo or not, however, it still must be a "review"—it must be premised on a record below in which all relevant claim construction issues were vetted and in which the parties had an opportunity to proffer intrinsic and extrinsic evidence which would inform the claim construction process. None of that occurred in this case. Instead, Alice's evidence and arguments were proffered and accepted by all as established fact. We are not persons of skill in the art and cannot open the record for proceedings that did not occur below. We are a reviewing court whose review must be predicated upon the record presented.

For these reasons, we agree with CLS, and with virtually every amicus to consider these claims, that all asserted claims must rise or fall together, because they all contain the same computer-based limitations.

IV

We turn to our view of the claims at issue here. This section of our opinion need not detain long. Along with Chief Judge Rader and Judge Moore, we have already explained why the system claims in this case are patent eligible and are not swallowed up by the exception from patent eligibility for claims that do no more than recite abstract ideas. *See* Rader/Linn/Moore/O'Malley Op. Part V. As we note, the claimed data processing system "includes at least four separate structural components" that perform very specific functions, *id.* at 1307, *see also* Moore Op. at 1320 ("[Claim 1 of the '375 patent] is a pure system claim, directed to a specific machine configured to perform certain functions."), and to describe the system as an abstraction ignores what is claimed, *see* Rader/Linn/Moore/O'Malley Op. at 1309 ("Labeling this system claim an 'abstract concept' wrenches all meaning from those words, and turns a narrow exception into one which may swallow the expansive rule (and with it much of the investment and innovation in software)."), *see also* Moore Op. at 1320 ("[I]t is impossible to conclude that this claim is merely an abstract idea.").[4]

For the reasons we describe herein, moreover, we would employ the same rationale we employed for the system claims to find the method and media claims patent eligible as well. The trial court construed these claims to require all the computer-implemented limitations of the system claims. Indeed, in doing so, the trial court conceded that there was meaningful support in the written description of the '479 and '510 patents for that construction. We have no record upon which to disagree with that construction of these claims, one which both parties continue to urge upon us. And, it is a careful assessment of the claims—with all their limitations—which must guide our inquiry.

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[4] We agree with Judge Moore's similar analysis of the system claims in her separate opinion, which we join in full.

As we said in the panel opinion in this case, moreover, assuming the presence of all the computer-based limitations in the written description, none of these claims are unduly pre-emptive. While the abstract idea at their heart may be the use of an intermediary to facilitate financial transactions, the claims here are directed to very specific ways of doing that—using "shadow credit record[s]" and "shadow debit record[s]" that are adjusted only if the "transactions . . . do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time," making the permitted transactions "in chronological order," and exchanging "credits" and "debits" "in accordance with the adjustments of the said permitted transactions." '479 patent col. 65 ll. 23-50. While it is possible these claims may have been obvious over the prior art—which, of course, would include the abstract idea itself—they do not preempt all commercial uses or applications of that idea.

V

We finally note that certain Amici express concern regarding the proliferation and aggressive enforcement of low quality software patents. *See* Br. of Amici Curiae Google Inc., Dell Inc., Facebook, Inc., Homeaway, Inc., Intuit Inc., Rackspace Hosting, Inc., Red Hat, Inc., and Zynga Inc. in Supp. of Pet'rs at 23-25 [hereinafter "Google Br."]; Amici Curiae Internet Retailers' Corrected Br. in Supp. of Neither Party at 14-22 [hereinafter "Internet Retailers Br."]. They seem to believe that patents on early generation technology inhibit technological advances. *See* Google Br. 23-25; Internet Retailers Br. 14-22. Based on these concerns, these Amici ask us to find all the claims at issue in the patents before us ineligible under the abstract ideas exception to § 101.

We do not discount Amici's concerns, we just disagree with what they ask us to do to quell them. Congress can, and perhaps should, develop special rules for software patents. It could, for instance, limit their life by limiting the term of such patents. *See* Peter S. Menell, *A Method for Reforming the Patent System*, 13 Mich. Telecomm. & Tech. L.Rev. 487, 501 (2007) (arguing patent reform should include "identifying and evaluating categorical reform options (such as excluding business method patents or altering the duration of software patents)."). Or, Congress could limit the scope of software patents by requiring functional claiming. *Cf.* Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013, at 42, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2117302, Stanford Pub.L. Working Paper No. 2117302, (arguing that the problems with software patents can be remedied through strict enforcement of the 35 U.S.C. § 112(f) limitations on functional claiming, not by "retroactively invalidat[ing] tens of thousands of software patents"). Or, it could do both, or devise some other rule. But broadening what is a narrow exception to the statutory definition of patent eligibility should not be the vehicle to address these concerns. While Congress may, this court may not change the law to address one technological field or the concerns of a single industry. *See United States v. Rutherford*, 442 U.S. 544, 555, 99 S.Ct. 2470, 61 L.Ed.2d 68 (1979) ("Under our constitutional framework, federal courts do not sit as councils of revision, empowered to rewrite legislation in accord with their own conceptions of prudent public policy."); *see also Anderson v. Wilson*, 289 U.S. 20, 27, 53 S.Ct. 417, 77 L.Ed. 1004 (1933) ("We do not pause to consider whether a statute differently conceived and framed would yield results more consonant with fairness and reason. We take the statute as we find it.").

Thus, whatever the merits of such concerns, the answer is not to rewrite the law by broadening the abstract ideas exception to § 101, especially if the only way to do so is to ignore the limitations in the claims actually before us.

VI

Appropriately treating the abstract ideas exception to patent eligibility under 35 U.S.C. § 101 as a narrow judge-made exception to a broad statutory grant, and being true to the record and claim constructions we are presented, we would find all claims at issue in this case patent eligible and would vacate the judgment of the lower court and remand for further proceedings. We dissent from this court's judgment which has the effect of doing otherwise.

Additional reflections filed by RADER, Chief Judge.

RADER, Chief Judge.

In the twenty-fifth year of my judicial service, I am wont to reflect on my early judicial experience in search of the confidence in the correctness of my judicial views that I then enjoyed. In this instance, my reflection carries me back to one of the first cases I helped decide as a new Circuit Judge on this court.

The case, *Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053 (Fed.Cir.1992), involved a patent on a software invention that allowed for swift computer analysis of electrocardiogram images to detect heart attack risks. Of course, I encountered the case flushed with confidence and a commitment to the law as written by our legislative branch, the branch to which I had dedicated my entire early career. In the face of this marvelous way to protect human life more efficiently and reliably, I found myself certain that this invention would "promote the Progress of the useful Arts." Moreover, the investment in research to develop that new method cried out for protection. Without protection, I reasoned, investors would quickly opt to put their resources into new cosmetics or weight control improvements—safer propositions. In sum, I thought this case was easy.

Therefore, I could only describe my emotion as surprise that my senior colleagues on the panel, Judges Newman and Lourie, struggled mightily. The author for the court performed impressive feats of intellectual acrobatics trying to gain some handhold to show that the mathematic equations in the method had some physical connection and no preemptive effect, whatever those concepts mean (and I still do not know if they have any meaning, let alone what that meaning might be). The court succeeded in converting "applying," "determining," and "comparing" into "physical process steps that transform one physical, electrical signal into another." *Id.* at 1059.

With some trepidation, I ventured to express my view that the statute settled the question without the need for laborious analysis. At the close of my opinion, I expressed a little frustration: "When all else fails . . . consult the statute." For me, *Parker v. Flook*, 437 U.S. 584, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978), *Gottschalk v. Benson*, 409 U.S. 63, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972), *In re Abele*, 684 F.2d 902 (CCPA 1982), *In re Walter*, 618 F.2d 758 (CCPA 1980), and *In re Freeman*, 573 F.2d 1237 (CCPA 1978), vindicated the proposition that "all else had failed." And for me, the magisterial statute with its sweeping inclusion of "any" process and even "improvements thereon" without any of the written exceptions for "software per se" or other legislative exceptions featured in failed European and Asian statutes settled the question. Indeed, as the law expressed and the Supreme Court recognized, an invention could extend to "anything under the sun that is made by man." *Diamond v. Diehr*, 450 U.S. 175, 182, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981) (quoting 182 S.Rep. No.1979, 82d Cong., 2d Sess., 5 (1952) and H.R.Rep. No.1923, 82d Cong., 2d Sess., 6 (1952)).

As I noted at the outset, a quarter century has passed. After *In re Alappat*, 33 F.3d 1526 (Fed.Cir.1994) (en banc), and a few other opinions, the law of patent eligibility enjoyed a halcyon decade of reliance on the statute. Inventions rose and fell, but based on the merits of their contributions to the progress of the useful arts, not on the basis of undefined and unproven judicial abstractions like "abstractness" or "preemption." Prior art governed the patentability of claims. The separate concept of patent eligibility of subject matter (not a claim-driven concept at all) was not subject to judicial preference for a broad or narrow view of formless substance.

Although *Diehr* and *Diamond v. Chakrabarty*, 447 U.S. 303, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980), betokened decades of enforcing the patent law as written, these giants too have bowed to new judicial influences. Twenty years ago, Judges Newman, Lourie, and I still unanimously agreed on the outcome of *Arrythmia*. The intervening commotion leaves us with little, if any, agreement amongst us even though the statute has not changed a syllable.

Thus, I find myself writing again as I did in 1992. And I find myself resorting to exactly the same phrase:

> When all else fails, consult the statute!

And for evidence that all else has failed, I need only recite *Bilski v. Kappos*, — U.S. —, 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010), *Mayo Collaborative Servs. Inc. v. Prometheus Labs., Inc.*, — U.S. —, 132 S.Ct. 1289, 182 L.Ed.2d 321 (2012), *Ass'n for Molecular Pathology v. U.S. Patent & Trademark Off.*, 689 F.3d 1303 (Fed.Cir.2012), cert granted in part, — U.S. —, 133 S.Ct. 694, 184 L.Ed.2d 496 (2012), *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250 (Fed.Cir.2012), *Dealertrack, Inc. v. Huber*, 674 F.3d 1315 (Fed.Cir.2012), and *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057 (Fed.Cir.2011), and this list can and will go on and grow.

And the remedy is the same: consult the statute! The statute offers a patent to both inventions and discoveries, including simply an improvement on a known process or product. The statute further directs that even the mere new use of an old machine is eligible for patenting, with, of course, a high obstacle of meeting the conditions of patentability set forth in Sections 102 and 103 of the Patent Act ahead. *See* S.Rep. No. 82-1979 at 17 (explaining that the new use of a known machine or composition of matter is eligible for patenting "provided the conditions of patentability are satisfied.") In that regard, the Supreme Court long ago held that Section 101 is not a "condition of patentability." *Diehr*, 450 U.S. at 189-90, 101 S.Ct. 1048 (citing *In re Bergy*, 596 F.2d 952, 963 (CCPA 1979) (Section 101 "was never intended to be a 'standard of patentability,' the standards, or conditions as the statute calls them, are in 102 and 103")). Finally, the statute does not list Section 101 among invalidity defenses to infringement. *See* 35 U.S.C. § 282 (while invalidity for failing to meet a "condition of patentability" is among the authorized defenses, Section 101 is not a "condition of patentability").

And what about "exceptions" like natural laws and natural phenomena? Of course, these are universal constants created, if at all, only by God, Vishnu, or Allah. But, for perspective, even gravity is not a natural law in Einsteinian theory, but a symptom of a curved universe. Einstein posited the speed of light as the only true natural constant. Thus, in context, equating the personalized medicinal effect of a human-created pharmaceutical in patients of different metabolic rates and genetic makeups with the speed of light (or even gravity) is only possible in a netherworld of undefined judicial insights. Moreover, to inject the patentability test of "inventiveness" into the separate statutory concept of subject matter eligibility makes this doctrine again "the plaything of the judges who, as they became initiated into its mysteries, delighted to devise and expound their own ideas of what it meant; some very lovely prose resulting." Giles S. Rich, *Principles of Patentability*, 28 Geo. Wash. L.Rev. 393, 404 (1960).

I enjoy good writing and a good mystery, but I doubt that innovation is promoted when subjective and empty words like "contribution" or "inventiveness" are offered up by the courts to determine investment, resource allocation, and business decisions. Again, it is almost . . . well, "obvious" . . . to note that when all else fails, it makes sense to consult the simplicity, clarity, and directness of the statute.

As I start my next quarter century of judicial experience, I am sure that one day I will reflect on this moment as well. I can only hope it is a brighter reflection than I encounter today.

APPENDIX B

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

No. 2011-1301

CLS BANK INTERNATIONAL,
Plaintiff-Appellee,

and

CLS SERVICES LTD.,
Counterclaim-Defendant Appellee,

v.

ALICE CORPORATION PTY. LTD.,
Defendant-Appellant.

July 9, 2012

Before LINN, PROST, and O'MALLEY, Circuit Judges.

OPINION

Opinion for the court filed by Circuit Judge LINN. Dissenting opinion filed by Circuit Judge PROST.

LINN, Circuit Judge.

This case presents, once again, the question of patent eligibility under 35 U.S.C. § 101 of an invention implemented by computers. For the reasons explained below, this court concludes that the system, method, and media claims at issue are not drawn to mere "abstract ideas" but rather are directed to practical applications of invention falling within the categories of patent eligible subject matter defined by 35 U.S.C. § 101. The decision of the district court to the contrary is reversed.

I. BACKGROUND

A. The Patents in Suit

Alice Corporation ("Alice") is the owner of U.S. Patent Nos. 5,970,479 ("the '479 Patent"), 6,912,510 ("the '510 Patent"), 7,149,720 ("the "720 Patent"), and 7,725,375 ("the '375 Patent"). These patents cover a computerized trading platform for exchanging obligations in which a trusted third party settles obligations between a first and second party so as to eliminate "settlement risk." Settlement risk is the risk that only one party's obligation will be paid, leaving the other party without its principal. The trusted third party eliminates this risk by either (a) exchanging both parties' obligations or (b) exchanging neither obligation.

As Alice's expert explained in a declaration attached to Alice's cross-motion for summary judgment and opposition to CLS Bank International and CLS Services Ltd.'s (collectively "CLS Bank") motion for summary judgment, "[w]hen obligations arise from a trade made between two parties, *e.g.*, a trade of stock or a trade of foreign currency, typically, there is a gap in time between when the obligation arises and when the trade is 'settled.'" Ginsberg Decl., ECF No. 95-3, Ex. 1 ¶ 21. "In a number of financial contexts, the process of exchanging obligations, or settlement, is separate from the process of entering into a contract to perform a trade." *Id.* For example, if two banks wish to exchange large sums of currency, they would enter into a binding agreement to make a particular exchange but would postpone the actual exchange until after the price is set and the agreement confirmed, typically two days. After those two days, both banks would "settle" the trade by paying their predetermined amounts to each other. But there is a risk that, at settlement time, one bank will no longer have enough money to satisfy its obligation to the other. The asserted patent claims—claims 33 and 34 of the '479 Patent, and all claims of the '510, '720, and '375 Patents—seek to minimize this risk. The relevant claims of the '479 and '510 Patents are method claims, whereas the claims of the '720 and '375 Patents are system and product (media) claims.

Claim 33 of the '479 Patent, representative of the method claims, recites:

> 33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:
>
> > (a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
> >
> > (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;
> >
> > (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these [sic] transactions that do not result in the value of the shadow debit record being less than

> the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and
>
> (d) at the end-of-day, the supervisory institution instructing one of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

'479 Patent col.65 ll.23-50.

Claim 1 of the '720 Patent, representative of the system claims, recites:

> 1. A data processing system to enable the exchange of an obligation between parties, the system comprising:
>
> a data storage unit having stored therein information about a shadow credit record and shadow debit record for a party, independent from a credit record and debit record maintained by an exchange institution; and
>
> a computer, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said shadow credit record and/or said shadow debit record in order to effect an exchange obligation arising from said transaction, allowing only those transactions that do not result in a value of said shadow debit record being less than a value of said shadow credit record; and (c) generate an instruction to said exchange institution at the end of a period of time to adjust said credit

> record and/or said debit record in accordance with the adjustment of said shadow credit record and/or said shadow debit record, wherein said instruction being an irrevocable, time invariant obligation placed on said exchange institution.

'720 Patent col.65 ll.42-61.

Claim 39 of the '375 Patent, representative of the product (media) claims, recites:

> 39. A computer program product comprising a computer readable storage medium having computer readable program code embodied in the medium for use by a party to exchange an obligation between a first party and a second party, the computer program product comprising:
>
> program code for causing a computer to send a transaction from said first party relating to an exchange obligation arising from a currency exchange transaction between said first party and said second party; and
>
> program code for causing a computer to allow viewing of information relating to processing, by a supervisory institution, of said exchange obligation, wherein said processing includes
>
> (1) maintaining information about a first account for the first party, independent from a second account maintained by a first exchange institution, and information about a third account for the second party, independent from a fourth account maintained by a second exchange institution;
>
> (2) electronically adjusting said first account and said third account, in order to effect an

> exchange obligation arising from said transaction between said first party and said second party, after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and
>
> (3) generating an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

'375 Patent col.68 ll.5-35.

B. District Court Proceedings

In May 2007, CLS Bank filed suit against Alice seeking a declaratory judgment that the '479, '510, and '720 Patents are invalid, unenforceable, or otherwise not infringed. In August 2007, Alice filed a counterclaim alleging that CLS Bank infringes claims 33 and 34 of the '479 Patent, and all claims of the '510 and '720 Patents.

In March 2009, CLS Bank moved for summary judgment contending that the asserted claims of the '479, '510, and '720 Patents are invalid under 35 U.S.C. § 101. Alice opposed and cross-moved for summary judgment. Following the Supreme Court's grant of certiorari in *In re Bilski*, 545 F.3d 943 (Fed.Cir.2008) (en banc) (*"Bilski I"*), *cert. granted sub. nom. Bilski v. Doll*, — U.S. —, 129 S.Ct. 2735, 174 L.Ed.2d 246 (2009), the district court denied the parties' cross motions for summary judgment as to subject matter eligibility without prejudice to re-filing following the Supreme Court's decision on certiorari.

In May 2010, the '375 Patent issued to Alice. In August 2010, Alice filed amended counterclaims additionally asserting that CLS Bank infringes all claims of the '375 Patent. After the Supreme Court decided *Bilski v. Kappos*, — U.S. —, 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010) ("*Bilski II*"), *affirming Bilski I*, 545 F.3d 943, the parties renewed their cross-motions for summary judgment, CLS Bank additionally asserting that the '375 Patent is invalid under 35 U.S.C. § 101. The district court granted CLS Bank's motion for summary judgment and denied Alice's cross-motion, holding that each asserted claim of Alice's four patents is invalid for failure to claim patent eligible subject matter. *CLS Bank Int'l v. Alice Corp.*, 768 F.Supp.2d 221 (D.D.C.2011). Alice timely appealed. This court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

II. DISCUSSION

A. Standard of Review

This court reviews the grant or denial of summary judgment under the law of the regional circuit. *MicroStrategy, Inc. v. Bus. Objects, S.A.*, 429 F.3d 1344, 1349 (Fed.Cir.2005). The D.C. Circuit reviews de novo a district court's grant of summary judgment. *Theodore Roosevelt Conservation P'ship v. Salazar*, 661 F.3d 66, 72 (D.C.Cir.2011). "We apply our own law with respect to issues of substantive patent law." *Aero Prods. Intern., Inc. v. Intex Recreation Corp.*, 466 F.3d 1000, 1016 (Fed.Cir.2006). "Whether a claim is drawn to patent eligible subject matter under § 101 is an issue of law that we review de novo." *Bilski I*, 545 F.3d at 951.

B. District Court's Analysis

In deciding CLS Bank's summary judgment motion, the district court first analyzed the method claims under the machine-or-transformation test. CLS Bank, for the purposes of advancing its § 101 motion, agreed to assume a claim construction favorable to Alice. *CLS Bank*, 768 F.Supp.2d at 236. Thus, the district court interpreted the shadow credit and debit records to require electronic implementation and a computer. *Id.* However, after a careful examination of the specification and the claims, the district court concluded that the "nominal recitation of a general-purpose computer in a method claim does not tie the claim to a particular machine or apparatus or save the claim from being found unpatentable under § 101." *Id.* at 237.

The district court also analyzed the method claims under the abstract idea exception. *Id.* at 242-43; *see Bilski II*, 130 S.Ct. at 3226 (holding that the machine-or-transformation test is an important and useful clue but that it should not be the sole test). Under this analysis, the district court found the methods to be invalid under § 101 as directed to the "fundamental idea of employing a neutral intermediary to ensure that parties to an exchange can honor a proposed transaction, to consummate the exchange simultaneously to minimize the risk that one party does not gain the fruits of the exchange, and then irrevocably to direct the parties, or their value holders, to adjust their accounts or records to reflect the concluded transaction." *CLS Bank*, 768 F.Supp.2d at 243-44.

The district court then analyzed the computer system and media claims. The district court assumed that these claims were directed to machines or manufactures, and thus analyzed these claims only to see whether they nonetheless represented nothing more than an abstract idea. *Id.* at 250. After noting its earlier conclusion that the method claims were directed to an abstract concept, the court concluded that "[t]he system claims . . . represent merely the incarnation of this abstract idea on a computer, without any further exposition or meaningful limitation." *Id.* at 252. Similarly, with respect to the product claims, the court concluded that they "are also directed to the same abstract concept, despite the fact they nominally recite a different category of invention under § 101 than the other claims." *Id.* at 255.

C. The Parties' Arguments on Appeal

With respect to its method claims, Alice argues that they are patent eligible because, unlike the claims at issue in *Bilski*, its method claims are: (1) "tied to a particular machine or apparatus—*i.e.*, they are to be performed on a computer," Appellant Br. 42; and (2) not directed to an abstract idea, but rather "are limited to a particular practical and technological implementation," which requires a particular series of concrete steps performed by an intermediary, *id.* 48-50; *see Research Corp. v. Microsoft Corp.*, 627 F.3d 859, 868-69 (Fed.Cir.2010). With respect to its computer system and media claims, Alice argues that "computer systems are concrete machines, not abstract ideas," Appellant Br. 23, and "[n]either this [c]ourt nor the Supreme Court has ever invalidated a claim to a computer system under 35 U.S.C. § 101," *id.* 2. According to Alice, the district court erred by: (1) identifying and considering only the "heart" of Alice's invention—which it found to be an abstract concept—instead of the claims "as a whole, with all of [their] limitations given effect," *id.* 26; (2) determining that "computers that are programmable with software—so-called 'general purpose' computers—should be analyzed differently from other machines under section 101," *id.* 31; *In re Alappat*, 33 F.3d 1526, 1545 (Fed.Cir.1994); and (3) focusing on the "preemptive force" of the claims as an independent test for eligibility when "[n]either the Supreme Court nor this [c]ourt has ever suggested that 'preemption' of a method or idea that is not a fundamental principle renders a patent claim invalid under section 101, nor that preemption is a separate step of the section 101 analysis if a claim has been determined not to be abstract," *id.* 35-36.

CLS Bank responds that "[a]ll of Alice's claims are directed to the unpatentable concept of 'exchanging an obligation' between parties (*i.e.*, effectuating a legal obligation) after an intermediary ensures that there is 'adequate value' in independent accounts maintained for the parties to allow the exchange to go forward—in effect, a two-sided escrow arrangement." Appellee Br. 7-8. With respect to Alice's method claims, CLS Bank contends that: (1) they fail the machine or transformation test because, "even assuming a broad claim construction . . . requiring computer implementation, such implementation does not impose a 'meaningful limitation' on the scope of the claims, because the computer does not play a 'significant part in permitting the claimed method to be performed,' but rather 'function[s] solely as an obvious mechanism for permitting a solution to be achieved more quickly,'" *id.* 11, 37-38 (citing *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1333 (Fed.Cir.2010)); (2) like "the claims in *Bilski*, [*Gottschalk v.*] *Benson* [409 U.S. 63, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972)], and [*Parker v.*] *Flook* [437 U.S. 584, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978)], Alice's method claims would effectively preempt the use of the abstract business concept for exchanging an obligation which is recited in all of the claims," *id.* 30; and

(3) "[l]ike the claims at issue in *Benson* and *Flook*, Alice's method claims . . . [are] effectively drawn to a formula or algorithm . . . with data collection preceding use of the algorithm, and account adjustments and instructions that are 'post-solution activity,'" *id.* 38. With respect to Alice's computer-implemented system and product claims, CLS Bank contends that they are also directed to abstract ideas because, under *Benson*, a mere "redrafting of method claims" to recite a "computer" and "data storage unit" that are "'configured' to carry out the abstract method" does not save the claims from abstractness. *Id.* 41-42.

For the reasons discussed below, this Court agrees with Alice that its asserted method, system, and product claims are all directed to patent eligible subject matter under 35 U.S.C. § 101.

D. Analysis

i. Patent Eligibility

The Patent Act defines patent eligible subject matter broadly: "Whoever invents or discovers *any* new and useful process, machine, manufacture, or composition of matter, or *any* new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101 (emphasis added). Section 101 is a "dynamic provision designed to encompass new and unforeseen inventions." *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135, 122 S.Ct. 593, 151 L.Ed.2d 508 (2001). As the Supreme Court has recognized, "Congress intended statutory subject matter to 'include anything under the sun that is made by man,'" *Diamond v. Chakrabarty*, 447 U.S. 303, 309, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980) (citing S.Rep. No. 82-

1979, at 5 (1952), 1952 U.S.C.C.A.N. 2394, 2399 and H.R.Rep. No. 82-1923, at 6 (1952)).

It is true, however, that not *everything* can be patented. The Supreme Court has explained that "laws of nature, physical phenomena, and abstract ideas" fall outside the scope of § 101, and are reserved to the public domain. *Bilski II*, 130 S.Ct. at 3225. In *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, the Supreme Court explained that these exceptions to statutory subject matter are "implicit" in the statute. — U.S. —, 132 S.Ct. 1289, 1293, 182 L.Ed.2d 321 (2012). "Such discoveries are 'manifestations of . . . nature, free to all men and reserved exclusively to none.'" *Id.* at 1293 (citing *Chakrabarty*, 447 U.S. at 309, 100 S.Ct. 2204) (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130, 68 S.Ct. 440, 92 L.Ed. 588 (1948)). In practice, these three exceptions should arise infrequently and should not be understood to subvert the patent's constitutional mandate "[t]o promote the Progress of Science and useful Arts." U.S. Const. art. I, § 8, cl. 8; *see, e.g.*, *Research Corp.*, 627 F.3d at 868 (Fed.Cir.2010) ("[S]ection 101 does not permit a court to reject subject matter categorically because it finds that a claim is not worthy of a patent.").

In contrast to § 101, which sets forth the type of subject matter that is patent eligible, §§ 102 and 103 broadly ensure that the public remains free to use that which is *known* and *obvious variants* thereof. *See* 35 U.S.C. §§ 102, 103. In addition, § 112 protects the public storehouse of knowledge by preventing persons from obtaining patent protection for inventions not fully disclosed, enabled, or claimed with particularity. *See* 35 U.S.C. § 112. The comprehensive provisions of 35 U.S.C. §§ 102, 103, and 112 do the substantive work of disqualifying those patent eligible inventions that are "not worthy of a patent." *Research Corp.*, 627 F.3d at 868. "Section 101 is a general statement of the type of subject matter that is eligible for patent protection 'subject to the conditions and requirements of this title.' Specific conditions for patentability follow. . . . The question therefore of whether an invention is novel 'is wholly apart from whether the invention falls into a category of statutory subject matter.'" *Diamond v. Diehr*, 450 U.S. 175, 198-90, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981) (citing *In re Bergy*, 596 F.2d 952, 961 (CCPA 1979)).

It should be self-evident that each of these four statutory provisions—§§ 101, 102, 103, and 112—serves a different purpose and plays a distinctly different role. No one section is more important than any other. Together, they evince the intent of Congress in furthering the constitutional objective of promoting the progress of the useful arts. Because each of these sections serves a different purpose and plays a different role, invalidity, patentability, and patent eligibility challenges under these sections present distinctly different questions. *See Prometheus*, 132 S.Ct. at 1303-04. District courts have great discretion to control the conduct of proceedings before them, including the order of presentation of issues and evidence and the sequence of events proscribed by the Federal Rules and leading up to judgment. *See, e.g.*, *Amado v. Microsoft Corp.*, 517 F.3d 1353, 1358 (Fed.Cir.2008) ("District courts . . . are afforded broad discretion to control and manage their dockets, including the authority to decide the order in which they hear and decide issues pending before them."). Although § 101 has been characterized as a "threshold test," *Bilski II*, 130 S.Ct. at 3225, and certainly *can* be addressed before other matters touching the validity of patents, it need not *always* be addressed first, particularly when other sections might be discerned by the trial judge as having the promise to resolve a dispute more expeditiously or with more clarity and predictability. *See MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1260 (Fed.Cir.2012). Thus, consistent with its role as the master of its own docket, a district court properly acts within its discretion in deciding when to address the diverse statutory challenges to validity.

Here, the district court exercised its discretion to entertain a challenge to the validity of the patents in suit under 35 U.S.C. § 101. The district court's decision ultimately turned on, and thus this appeal is primarily directed to, the issue of whether the claimed inventions fall within the "abstract ideas" exception to patent eligibility. While the Supreme Court's recent decision in *Prometheus* reiterated the trilogy of "implicit" exceptions to patent eligibility, including the exception for abstract ideas, it did not directly address how to determine whether a claim is drawn to an abstract idea in the first instance.

The abstractness of the "abstract ideas" test to patent eligibility has become a serious problem, leading to great uncertainty and to the devaluing of inventions of practical utility and economic potential. *See* Donald S. Chisum, *Weeds and Seeds in the Supreme Court's Business Method Patent Decision: New Directions for Regulating Patent Scope*, 15 Lewis & Clark L.Rev. 11, 14 (2011) ("Because of the vagueness of the concepts of an 'idea' and 'abstract,' . . . the Section 101 abstract idea preemption inquiry can lead to subjectively-derived, arbitrary and unpredictable results. This uncertainty does substantial harm to the effective operation of the patent system."). In *Bilski*, the Supreme Court offered some guidance by observing that "[a] principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Bilski II*, 130 S.Ct. at 3230 (quoting *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 175, 14 L.Ed. 367 (1852)). This court has also attempted to define "abstract ideas," explaining that "abstract ideas constitute disembodied concepts or truths which are not 'useful' from a practical standpoint standing alone, *i.e.*, they are not 'useful' until reduced to some practical application." *Alappat*, 33 F.3d at 1542 n. 18 (Fed.Cir.1994). More recently, this court explained that the "disqualifying characteristic" of abstractness must exhibit itself "manifestly" "to override the broad statutory categories of patent eligible subject matter." *Research Corp.*, 627 F.3d at 868. Notwithstanding these well-intentioned efforts and the great volume of pages in the Federal Reporters treating the abstract ideas exception, the dividing line between inventions that are directed to patent ineligible abstract ideas and those that are not remains elusive. "Put simply, the problem is that no one understands what makes an idea 'abstract.'" Mark A. Lemley et al., *Life After* Bilski, 63 Stan. L.Rev. 1315, 1316 (2011).

Several decisions have looked to the notion of "preemption" to further elucidate the "abstract idea" exception. In *Bilski*, the Supreme Court explained that "[a]llowing petitioners to patent risk hedging would *preempt use of this approach in all fields*, and would effectively grant a monopoly over an abstract idea." 130 S.Ct. at 3231 (emphasis added). Previously, in *O'Reilly v. Morse*, 56 U.S. 62, 15 How. 62, 14 L.Ed. 601 (1853), the Supreme Court held that a claim to electromagnetism was not eligible for patent protection because the patentee "claim[ed] *the exclusive right to* *every improvement* where the motive power is the electric or galvanic current, and the result is the marking or printing intelligible characters, signs, or letters at a distance." *Id.* at 112-13 (emphases added). The *Morse* Court reasoned that the claim would effectively "*shut* [ ] *the door against inventions of other persons* . . . in the properties and powers of electro-magnetism" because "*it matters not by what process or machinery the result is accomplished.*" *Id.* at 113 (emphasis added). Again, in *Gottschalk v. Benson*, 409 U.S. 63, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972), the Supreme Court emphasized the concept of "pre-emption," holding that a claim directed to a mathematical formula with "no substantial practical application except in connection with a digital computer" was directed to an unpatentable abstract idea because "the patent would *wholly pre-empt the mathematical formula* and in practical effect would be a patent on an algorithm itself." *Id.* at 71-72, 93 S.Ct. 253 (emphasis added). In *Parker v. Flook*, 437 U.S. 584, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978), the Court again emphasized the importance of claims not "preempting" the "basic tools of scientific and technological work," and further held that mere field of use limitations—there, to the oil refining and petrochemical industries—or the addition of "post-solution" activity—there, adjusting an "alarm limit" according to a claimed mathematical calculation—could not "transform an unpatentable principle into a patentable process." *Id.* at 589, 98 S.Ct. 2522.

In contrast to *Morse*, *Benson*, and *Flook*—where the claims were found to "pre-empt" an "idea" or algorithm—in *Diehr*, the Supreme Court held that the claims at issue (directed to a process for curing rubber using the mathematical "Arrhenius" equation) *did not* "pre-empt the use of that equation." *Diehr*, 450 U.S. at

187, 101 S.Ct. 1048. Rather, the claims "only foreclose[d] from others the *use of that equation in conjunction with all of the other steps in the* [ ] *claimed process.*" *Id.* (emphasis added). The *Diehr* Court held that the claims were "not barred at the threshold by § 101" because they were "an *application* of a law of nature or mathematical formula to a known structure or process," which "incorporate[d] in it a more efficient solution of the equation." *Id.* at 187, 188, 101 S.Ct. 1048.

Our Constitution gave Congress the power to establish a patent system "[t]o promote the Progress of Science and useful Arts. . . ." U.S. Const. art. I, § 8, cl. 8. The patent system is thus intended to foster, not foreclose, innovation. *See id.* While every inventor is granted the right to exclude, or "pre-empt," others from practicing his or her claimed invention, no one is entitled to claim an exclusive right to a fundamental truth or disembodied concept that would foreclose *every future innovation* in that art. *See Morse*, 56 U.S. at 112-13. As the Supreme Court has "repeatedly emphasized . . . patent law [must] not inhibit further discovery by improperly tying up the future use of laws of nature." *Prometheus*, 132 S.Ct. at 1301. "[T]here is a danger that grant of patents that tie up [laws of nature, physical phenomena, and abstract ideas] will inhibit future innovation premised upon them, a danger that becomes acute when a patented process amounts to *no more than* an instruction to 'apply the natural law,' or otherwise forecloses more future invention than the underlying discovery could reasonably justify." *Id.* (emphasis added); *see also Benson*, 409 U.S. at 68, 93 S.Ct. 253 ("Here the 'process' claim is so abstract and sweeping as to cover both known and *unknown* uses of the BCD to pure binary conversion." (emphasis added)). Thus, the essential concern is not preemption, *per se*, but the extent to which preemption results in the foreclosure of innovation. Claims that are directed to no more than a fundamental truth and foreclose, rather than foster, future innovation are not directed to patent eligible subject matter under § 101. No one can claim the exclusive right to all future inventions. *Morse*, 56 U.S. at 112-13; *Benson*, 409 U.S. at 68, 93 S.Ct. 253.

In determining whether a claim is directed to a non-statutory abstract idea, the Supreme Court acknowledged this court's "machine-or-transformation test [as] a useful and important clue, an investigative tool," but not as a dispositive test. *Bilski II*, 130 S.Ct. at 3227. As four Supreme Court Justices acknowledged, during the Industrial Age, few patents were granted for discoveries that did not satisfy the machine-or-transformation test. *Id.* Today, computers play a role in every part of our daily life. They are found in everything from toasters to transponders. The computer, with all of its hardware and software variations, may be one of the greatest inventions of all time, and there can be no question that advances in computer technology have fostered and will continue to foster innovation in all areas of science and technology. Many patents drawn to inventions implemented in computer hardware or software, however, are argued not to pass the machine-or-transformation test. Thus, courts must sometimes look beyond the machine-or-transformation test to distinguish eligible from ineligible computer-related claims. *See Bilski II*, 130 S.Ct. at 3227.

The mere implementation on a computer of an otherwise ineligible abstract idea will not render the asserted "invention" patent eligible. *See Fort Props. Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1322

(Fed.Cir.2012) ("[An] abstract concept cannot be transformed into patentable subject matter merely because of connections to the physical world."); *Dealertrack Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed.Cir.2012) ("Simply adding a 'computer aided' limitation to a claim covering an abstract concept, without more, is insufficient to render the claim patent eligible."); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed.Cir.2011) ("[W]e have never suggested that simply reciting the use of a computer to execute an algorithm that can be performed entirely in the human mind" is sufficient to render a claim patent eligible.). On the other hand, where the "addition of a machine impose[s] a meaningful limit on the scope of a claim," and "play[s] a significant part in permitting the claimed method to be performed, *rather than function[ing] solely as an obvious mechanism for permitting a solution to be achieved more quickly*, i.e., through the utilization of a computer for performing calculations," that machine limitation renders the method patent eligible. *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1333 (Fed.Cir.2010) (emphasis added); *see also Diehr*, 450 U.S. at 187, 101 S.Ct. 1048 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."); *Research Corp.*, 627 F.3d at 868 (holding that a process is patent eligible subject matter when it "presents functional and palpable application in the field of computer technology."); *Alappat*, 33 F.3d at 1544-45 (holding that claims directed to a specially-programmed computer—a "specific machine to produce a useful, concrete, and tangible result"—are directed to patent eligible subject matter). It can, thus, be appreciated that a claim that is drawn to a *specific way* of doing something with a computer is likely to be patent eligible whereas a claim to *nothing more than the idea* of doing that thing on a computer may not.[1] But even with that appreciation, great uncertainty remains, and the core of that uncertainty is the meaning of the "abstract ideas" exception.

As the Supreme Court has recently acknowledged, "too broad an interpretation of [the exceptions to § 101] could eviscerate patent law. For all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Prometheus*, 132 S.Ct. at 1293. Any claim can be stripped down, or simplified, removing all of its concrete limitations, until at its core, something that could be characterized as an abstract idea is revealed. But nothing in the Supreme Court's precedent, nor in ours, allows a court to go hunting for abstractions by ignoring the concrete, palpable, tangible, and otherwise not abstract invention the patentee actually claims. It is fundamentally improper to paraphrase a claim in overly simplistic generalities in assessing whether the claim falls under the limited "abstract ideas" exception to patent eligibility under 35 U.S.C. § 101. Patent eligibility must be evaluated based on what the claims recite, not merely on the ideas upon which they are premised. In assessing patent eligibility, a court must consider the asserted claim as a whole. *Diehr*, 450 U.S. at 188, 101 S.Ct. 1048.

> It is inappropriate to dissect the claim into old and new elements and then to ignore the presence of

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[1] *See Lemley*, 63 Stan. L.Rev. at 1345 ("Under an appropriate § 101 scope analysis, the relevant concern is not whether there is a physical machine per se in the specification or claim language. Rather, the question should be whether the claim is so abstract and sweeping as to preclude all uses of the inventive idea, or whether it is sufficiently applied.").

> the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. The 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.

Id. at 188-89, 101 S.Ct. 1048.[2]

In light of the foregoing, this court holds that when—after taking all of the claim recitations into consideration—it is not manifestly evident that a claim is directed to a patent ineligible abstract idea, that claim must not be deemed for that reason to be inadequate under § 101. It would undermine the intent of Congress to extend a judicially-crafted exception to the unqualified statutory eligibility criteria of § 101 beyond that which is "implicitly" excluded as a "fundamental truth" that is "free to all men and reserved exclusively to none." ***Bilski II***, 130 S.Ct. at 3225, 3230 (citations omitted); *see also id.* at 3226 ("This Court has 'more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed.'" (quoting ***Diehr***, 450 U.S. 175, 182, 101 S.Ct. 1048 (citation omitted))). Unless the single most reasonable understanding is that a claim is directed to nothing more than a fundamental truth or disembodied concept, with no limitations in the claim attaching that idea to a specific application, it is inappropriate to hold that the claim is directed to a patent ineligible "abstract idea" under 35 U.S.C. § 101.[3]

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[2] The dissent contends that following *Prometheus*, "there is no doubt that to be patent eligible under § 101, the claims must include an 'inventive concept.'" Dissent 1357. From this, the dissent criticizes the majority for not inquiring whether the asserted claims include such an inventive concept or even whether the claims disclose anything inventive. But that is precisely what the majority has done in examining the language of the claims themselves and in criticizing the district court for ignoring the invention the patentee actually claims. The Supreme Court's reference to an "inventive concept" cannot be read to endorse overlooking the actual terms of the claims or the distillation of claim language to mere generalities. *Prometheus* simply states "that a process that focuses upon the use of a natural law also contain *other elements or a combination of elements*, sometimes referred to as an 'inventive concept,' *sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself*." *Prometheus*, 132 S.Ct. at 1294 (emphases added). This is not a new idea, and imposes no "novelty" or "nonobviousness" inquiry into the patent eligibility analysis under § 101. *See Diehr*, 450 U.S. at 188-89, 101 S.Ct. 1048.

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[3] The dissent expresses concern that the majority "devises a new approach to subject matter patentability" in the face of perceived Supreme Court guidance. Dissent 1356-57. With all due respect for my sister in the dissent, the majority does no such thing. The majority merely recognizes that before the "implicit" exception for abstractness recognized by the Supreme Court and acknowledged by this court is allowed to overtake the intent of Congress as reflected in the broad statutory language of § 101, the determination of abstractness must be manifest. If a court, in applying all of the guidance of the Supreme Court in cases like ***Prometheus***, ***Bilski II***, ***Diehr***, ***Flook***, and ***Benson***, and in considering all of the precedent from this court in cases like ***Fort Properties***, ***Dealertrack***, ***CyberSource***, ***Research Corp.***, ***SiRF***, and ***Alappat***, is not wholly convinced that the subject matter of the claims is abstract, the claims in question must be held patent eligible.

ii. Application

Alice's asserted claims are directed generally to the exchange of obligations between parties using a computer. The asserted patents, with the exception of minor differences, share a common specification. While the method, system, and media claims fall within different statutory categories, the form of the claim in this case does not change the patent eligibility analysis under § 101. *CyberSource*, 654 F.3d at 1374. "Regardless of what statutory category ("process, machine, manufacture, or composition of matter," . . .) a claim's language is crafted to literally invoke, we look to the underlying invention for patent eligibility purposes." *Id*. "Labels are not determinative in § 101 inquiries . . . because the form of the claim is often an exercise in drafting." *In re Maucorps*, 609 F.2d 481, 485 (CCPA 1979) (internal citation omitted). Contrary to Alice's argument, therefore, the fact that computer systems are "machines" does not end the inquiry. *Alappat*, 33 F.3d at 1542 ("Because claim 15 is directed to a 'machine,' . . . [it] appears on its face to be directed to § 101 subject matter. This does not quite end the analysis, however, because the Board majority argues that the claimed subject matter falls within . . . the 'mathematical algorithm' exception."). "[T]he basic character of a process claim . . . is not changed by claiming only its performance by computers, or by claiming the process embodied in program instructions on a computer readable medium." *CyberSource*, 654 F.3d at 1375.

Because mere computer implementation cannot render an otherwise abstract idea patent eligible, *see id*. at 1374-75, the analysis here must consider whether the asserted claims (method, system, and media) are substantively directed to nothing more than a fundamental truth or disembodied concept without any limitation in the claims tying that idea to a specific application, *see supra* Part II.D.i. The district court looked past the details of the claims in characterizing them as being directed to the fundamental concept "of employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk." *CLS Bank*, 768 F.Supp.2d at 243. By doing so, the district court was able to treat the claims as encompassing nothing more than fundamental truths, much like the patent ineligible "abstract ideas" in *Bilski*, and this court's post-*Bilski* cases: *CyberSource*, *Dealertrack*, and *Fort Properties*. As explained above, however, ignoring claim limitations in order to abstract a process down to a fundamental truth is legally impermissible.[4]

Determining whether Alice's claims are directed to nothing more than a fundamental truth or disembodied concept requires this court to consider the scope and content of the claims. For the purpose of deciding patent eligibility at the district court, the parties agreed to a broad claim construction that was favorable to Alice. The district court concluded that each claim, including each of Alice's method claims, discussed below, requires computer implementation. *See CLS Bank*, 768 F.Supp.2d at 236 ("CLS has agreed to a broad construction of terms favorable to Alice, and because the specification reveals a computer based invention, the Court can reasonably assume for present purposes that the terms 'shadow' credit and/or debit record and 'transaction' in the '479 Patent recite electronic implementation and a computer or an analogous electronic device.").

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[4] The dissent engages in the same flawed analysis as the district court by allegedly "[s]tripp[ing the claims] of jargon" and creating a table of the "plain English translation" for each claim element. Dissent 1357-58. It is impermissible for the court to rewrite the claims as it sees them. The invention is defined in the claims by the patentee, not the court. *See* 35 U.S.C. § 112.

The patent specifications are consistent with the understanding that each asserted claim requires computer implementation. The asserted system and media claims of the '720 and '375 Patents explicitly recite "machine" limitations. *See, e.g.*, '720 Patent col.65 ll.42-48 ("A data processing system . . . comprising a data storage unit . . . ; and a computer. . . ."); '375 Patent col.68 ll.5-7 ("A computer program product comprising a computer readable storage medium having computer readable program code embodied in the medium. . . .").

With respect to the asserted method claims, the '510 Patent claims recite an "electronic adjustment" limitation, *see, e.g.*, '510 Patent col.64 ll.11-12 (independent claim 1), which, for the purpose of this motion, CLS Bank agreed "requir[es] the use of a computer." Appellee Br. 6. The '510 Patent specification is consistent with the understanding that the claims require the use of a computer system. *See* '510 Patent col.3 ll.45-46 (disclosure of the invention) ("The entities submit such orders to a 'system' which seeks to price and match the most appropriate counter-party. . . ."); col.28 l.45-col.29 l.4 (explaining that the shadow debit/credit records are electronically stored in a system called "INVENTICO"); col.29 ll.41-56 ("[E]ach [participating] entity electronically notifies the applicable CONTRACT APP of the 'opening balances' of all the debit and credit INVENTICO accounts it maintains. . . . Upon receipt of [these] notifications, the applicable CONTRACT APP updates/confirms its stakeholder shadow balances. Thus, at this point-in-time, all credit and debit shadow account balances should be equivalent to their actual debit and credit account balances.").

The specification of the '479 Patent is similarly consistent with the understanding that the asserted claims require computer implementation. '479 Patent col.3 ll.29-38 (disclosure of the invention) (same as '510 Patent); col.4 ll.8-12 ("The present invention also provides an automated infrastructure . . . [which] allows the parties to participate directly without requiring an intermediary.") According to Alice's expert, "the person of ordinary skill in the art would understand . . . that claims 33 and 34 of the '479 [P]atent are limited to electronically implemented methods." Ginsberg Decl., ECF No. 95-3, Ex. 1, ¶ 32. While the asserted claims of the '479 Patent do not contain the "electronic adjustment" limitation, they do contain the same "shadow credit record" and "shadow debit record" limitations as the '510 Patent claims. The specification of the '479 Patent, like the '510 Patent, supports the understanding that the shadow debit/credit record limitations require computer implementation. *See* '479 Patent col.24 l.59-col.25 l.2 (explaining that the "CONTRACT APP" effects debits and credits to accounts in the INVENTICO system by "debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of applicable stakeholder accounts . . . , [which are] external to INVENTICO."). Alice's expert testified in his declaration that one of skill in the art understands that the "data file PAYACC SHADOW" is a "data file[ ] in a data storage unit." Ginsberg Decl., ECF No. 95-3, Ex. 1, ¶ 32. We find no basis to question the district court's assumption, for the purposes of this motion, that all of Alice's asserted claims require a computer system. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1315-16 (Fed.Cir.2005) (en banc).

Although computer implementation indicates that these claims would likely satisfy the "machine" prong of the machine-or-transformation test, *see CyberSource*, 654 F.3d at 1375 and *Alappat*, 33 F.3d at 1545, the mere fact of computer implementation alone does not resolve the patent eligibility question, *see Dealertrack*, 674 F.3d at 1333 ("Simply adding a 'computer aided' limitation to a claim covering an abstract concept, without more, is insufficient to render the claim patent eligible."); *CyberSource*, 654 F.3d at 1375. Indeed, almost every method in the Digital Age can be implemented on a specially-programmed computer. *See, e.g.*, *SiRF Tech.*, 601 F.3d at 1333 ("In order for the addition of a machine to impose a meaningful limit on the scope of a claim, it must play a significant part in permitting the claimed method to be performed, rather than function solely as an obvious mechanism for permitting a solution to be achieved more quickly, i.e., through the utilization of a computer for performing calculations.").

In *Bilski*, *CyberSource*, *Dealertrack*, and *Fort Properties* ("the *Bilski* line of cases"), the Supreme Court or this court found some basis in the claims upon which to determine that they were directed to nothing more than patent ineligible abstract ideas. Unlike the *Bilski* line of cases, however, it is difficult to conclude that the computer limitations here do not play a significant part in the performance of the invention or that the claims are not limited to a very specific application of the concept of using an intermediary to help consummate exchanges between parties. The dissent criticizes the majority for failing to explain "why the specific computer implementation in this case brings the claims within patentable subject matter," Dissent 1357, but this criticism is misplaced. The limitations of the *claims as a whole*, not just the computer implementation standing alone, are what place meaningful boundaries on the meaning of the claims in this case.

The asserted claims appear to cover the practical application of a business concept in a specific way, which requires computer implemented steps of exchanging obligations maintained at an exchange institution by creating electronically maintained shadow credit and shadow debit records, and particularly recite that such shadow credit and debit records be held independently of the exchange institution by a supervisory institution; that start-of-the-day balances be obtained from the exchange institution; that adjustments be made to the credit records based on only certain specified allowed transactions under the "adjusting" limitation; that such adjustments be made in chronological order; that at the end of the day, instructions be given to the exchange institution to reflect the adjustments made on the basis of the permitted transactions; and that such adjustments affect irrevocable, time invariant obligations placed on the exchange institution. '479 Patent col.65 ll.28-50. Transactions "that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time" are not permitted under the "adjusting" limitation, and do not result in any ultimate exchange of obligations in the INVENTICO system. *Id*. col.65 ll.36-43, col.24 l.59-col.25 l.2. The claim limitations can be characterized as being integral to the method, as "play[ing] a significant part in permitting the method to be performed," and as not being token post-solution activity. It is clear, moreover, that the limitations requiring specific "shadow" records leave broad room for other methods of using intermediaries to help consummate exchanges, whether with the aid of a computer or otherwise, and, thus, do not appear to preempt much in the way of innovation.

While the use of a machine in these limitations is less substantial or limiting than the industrial uses examined in *Diehr* (curing rubber) or *Alappat* (a rasterizer), the presence of these limitations prevents us from finding it manifestly evident that the claims are patent ineligible under § 101. *See Research Corp.*, 627 F.3d at 868. In such circumstances, we must leave the question of validity to the other provisions of Title 35.

Accordingly, this court holds that Alice's method, system, and product claims are directed to statutory subject matter under § 101.

III. CONCLUSION

For the foregoing reasons, this court reverses the district court's summary judgment of invalidity under 35 U.S.C. § 101 of claims 33 and 34 of the '479 Patent and each claim of the '510, '720, and '375 Patents.

REVERSED

PROST, Circuit Judge, dissenting.

The majority resists the Supreme Court's unanimous directive to apply the patentable subject matter test with more vigor. Worse yet, it creates an entirely new framework that in effect allows courts to avoid evaluating patent eligibility under § 101 whenever they so desire. I too find it difficult to answer the questions presented here with absolute certainty. Nonetheless, I believe that precedent and common sense counsel that the asserted patent claims are abstract ideas repackaged as methods and systems. Thus, with respect, I dissent.

I

When it comes to subject matter patentability, we do not write on a blank slate. Just a few months ago, the Supreme Court reversed us in a § 101 case for a second time in its last three terms, hinting (not so tacitly) that our subject matter patentability test is not sufficiently exacting. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, — U.S. —, 132 S.Ct. 1289, 182 L.Ed.2d 321 (2012); *Bilski v. Kappos*, — U.S. —, 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010); *see also WildTangent, Inc. v. Ultramercial, LLC*, — U.S. —, 132 S.Ct. 2431, 182 L.Ed.2d 1059 (2012), *granting cert., vacating, and remanding Ultramercial, LLC v. Hulu*, LLC, 657 F.3d 1323 (Fed.Cir.2011). The Court once again iterated that "the prohibition against patenting abstract ideas cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Prometheus*, 132 S.Ct. at 1294 (quoting *Bilski*, 130 S.Ct. at 3230). But this time the Court also made clear what had been written between the lines before: It is not sufficient to put an abstract idea into use with "[p]urely 'conventional or obvious' 'pre-solution activity.'" *Prometheus*, 132 S.Ct. at 1298; *cf. Bilski*, 130 S.Ct. at 3231 (noting that the claimed invention was directed at a "fundamental economic practice long prevalent in our system of commerce"); *Parker v. Flook*, 437 U.S. 584, 594, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) ("Respondent's process is unpatentable under § 101, not because it contains a mathematical algorithm as one component, but because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention."). The Court accordingly declined the Solicitor General's invitation to leave the screening of low quality patents to § 102 and § 103, even though the government promised that "the claims are likely invalid under those provisions." Brief for the United States as Amicus Curiae in Support of Neither Party at 9, *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, — U.S. —, 132 S.Ct. 1289, 182 L.Ed.2d 321 (2012). Now there is no doubt that to be patent eligible under § 101, the claims must include an "inventive concept." *Prometheus*, 132 S.Ct. at 1294.

The majority has failed to follow the Supreme Court's instructions—not just in its holding, but more importantly in its approach. The majority does not inquire whether the asserted claims include an inventive concept. Even more fundamentally, the majority questions whether the Supreme Court's abstract idea test is workable at all. Maj. Op. 1348-49. Based on this apprehension, I take it, the majority devises a new approach to subject matter patentability. We must now avoid deciding a § 101 case unless unpatentability is "manifestly evident." Maj. Op. 1352.

I would be more empathetic if the majority's approach was based on a case-specific determination, made upon the application of the Supreme Court's abstract idea test to the asserted claims. As mentioned, however, the majority does not even attempt to inquire whether the claims disclose anything inventive. The bulk of the analysis focuses on the fact that the claims require "computer implementation," which the majority itself deems insufficient to pass muster under § 101. Maj. Op. 1352-55. Nor is there any explanation for why the specific computer implementation in this case brings the claims within patentable subject matter. *See also infra* Part III. The majority merely posits that the additional limitations in the claims "can be characterized as being integral to the [invention]," but it does not explain whether they *should* be characterized as such, and what "integral" means in the context of § 101 in the first place. Maj. Op. 1355-56.

So why does the majority reverse the district court? Frankly, because "it is difficult to conclude that the computer limitations here do not play a significant part in the performance of the invention." Maj. Op. 1355. That suggests that the majority's "manifestly evident" standard is more of an escape hatch than a yardstick. In other words, the majority has resurrected the very approach to § 101 that the Solicitor General advocated—and the Supreme Court laid to rest—in *Prometheus*. I cannot agree.

II

Even if we were to punt the subject matter issue whenever it is difficult, we would not have any justification for reversing the district court in this case—especially on the method claims. The basic idea behind the claimed invention is the use of an intermediary in a financial transaction. At its most basic form, in a transaction between parties 'A' and 'B,' a middle-man collects funds from 'A' but will not pass them to 'B' until 'B' has also performed. In more complicated settings, the intermediary makes intelligent choices in selecting the parties to the transaction in a way to minimize or hedge the transaction risk. In any event, this basic idea of "credit intermediation" is not just abstract; it is also literally ancient. *See* Temin, Peter, *Financial Intermediation in the Early Roman Empire* (November 2002), MIT Department of Economics Working Paper No. 02-39, *available at* http://ssrn.com/abstract=348103 or http://dx.doi.org/10.2139/ssrn.348103 (exploring the use of financial intermediaries in the Early Roman Empire).

So where is the invention? The majority states that it is not the computer implementation, but "the claims as a whole" that make the invention patentable. Maj. Op. at 1355. But setting any need for computer implementation aside, there is nothing in the method steps themselves that brings the invention within patentable subject matter. Stripped of jargon, representative method claim 33 simply breaks down the idea of a financial intermediary into four steps: (a) creating a debit and credit account for each party, (b) checking the account balances in the morning, (c) adjusting the account balances through the day, and (d) paying the parties at the end of the day if both parties have performed.[1] The claim in effect presents an abstract

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[1] Table 1:

The Recited Steps	Plain English Translation
(a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;	(a) creating a debit and credit account for each party,
(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;	(b) checking the account balances in the morning,
(c) for every transaction resulting in an exchange hange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record. allowing only these [sic] transactions that do not	(c) adjusting the account balances through the day, and

idea and then says "apply it." That is not enough. *Prometheus*, 132 S.Ct. at 1294 ("[T]o transform an unpatentable law of nature into a patent-eligible *application* of such a law, one must do more than simply state the law of nature while adding the words 'apply it.'").

The majority objects that "[i]t is impermissible for the court to rewrite claims as it sees them." Maj. Op. 1353-54 n. 4. But that is precisely what courts do in claim construction everyday. Perhaps what the majority actually means is that the plain English translation in Table 1 somehow glosses over a limitation that would otherwise narrow the claims to something that is non-abstract. One would wish that the majority had not kept that limitation a secret. The only hint appears

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result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and.	
(d) at the end-of-day, the supervisory institution instructing one of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions	(d) paying the parties at the end of the day if both parties have sufficiently performed.

where the majority points to the phrase "shadow records," as if that alone transmutes the abstract idea of the claims into patentable subject matter. Maj. Op. 1355-56. But the claims use "shadow" to simply define an account that is used to track a party's payments (the account is a shadow of the party's performance). That is not a limiting feature at all; any financial intermediation would in one way or another use a "shadow" account. Therefore, the representative method claim does not limit the method steps in a way that the Supreme Court considers to be meaningful. It merely recites the steps of performing as an intermediary in a financial transaction, which is an abstract idea, nothing more and nothing less. *Cf. Bilski*, 130 S.Ct. at 3231.

That leaves determining whether the computer implementation—assuming one is required by the method claims—makes the invention patentable. It does not. As the majority itself notes, "the mere fact of computer implementation alone does not resolve the patent eligibility question." Maj. Op. 1355. Nor is there anything about the use of computers in the method claims in this case that brings them within patentable subject matter. In *Gottschalk v. Benson*, 409 U.S. 63, 65, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972), for example, the Supreme Court considered a patent "on a method of programming a general-purpose digital computer to convert signals from binary-coded decimal form into pure binary form." *Id.* Most of the steps of representative claim 8 expressly required the use of a shift register, a form of digital computer. *Id.* at 73, 93 S.Ct. 253. Indeed, the Supreme Court emphasized that the conversion method had "no substantial practical application except in connection with a digital computer." *Id.* at 71, 93 S.Ct. 253. That did not prevent the Court from holding, however, that the asserted claims were abstract. *Id.* at 72-73, 93 S.Ct. 253. More recently, we evaluated the patentability of a claim for "[a] computer aided method of managing a credit application" that recited a "display device" and "terminal devices," which the district court correctly construed as some form of computer implementation. *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1331-35 (Fed.Cir.2012). We nonetheless looked beyond the computer implementation to the inventive concept of the patent and held that the claim disclosed an abstract idea. *Id.* at 1333 ("Dealertrack's claimed process in its simplest form includes three steps: receiving data from one source (step A), selectively forwarding the data (step B, performed according to step D), and forwarding reply data to the first source (step C). The claim 'explain[s] the basic concept' of processing information through a clearinghouse [and is therefore abstract]."); *see also Fort Props., Inc. v. Am. Master Lease, LLC*, 671 F.3d 1317, 1323-24 (Fed.Cir.2012) (holding that a claim limitation that required a computer to generate deedshares was abstract).

These authorities should have compelled us to hold that the asserted method claims in this case are abstract. The connection between the basic idea behind the claimed invention and the use of computers is not any stronger here than the relationship between the binary conversion system and the shift register in *Benson*, or the credit application system and computers in *Dealertrack*. Indeed, unlike in *Benson* and *Dealertrack*, the representative method claim does not even recite the use of a computer. And while some of the dependent claims recite computers, the specification shows that the use of computers is simply incidental. *See also infra* Part III. As I see it, therefore, the method claims do not present a difficult case. But district courts and litigants will now face a difficult task in deciphering the law and harmonizing precedent: What is it that sets *Benson*, *Bilski*, and *Prometheus*—and *Dealertrack*—apart from this case, and what legal principle justifies responding to a unanimous Supreme Court decision against patentability with even a stricter subject matter standard? I do not know, and I cannot find the answer in the majority opinion.

III

The system claims present somewhat of a closer question, in part because the Supreme Court has not decided a § 101 case that involves system claims. There is a perfectly reasonable argument that system claims are never abstract as a matter of law. After all, systems comprise objects, and objects are literally not abstract. A bright-line rule that brings all systems within patentable subject matter is also easy to comprehend and administer. Evaluating whether systems are abstract, on the other hand, may run the risk of stepping too far into making novelty and obviousness determinations under the guise of the abstractness test.

Nonetheless, I would affirm the district court on the system claims as well. To begin with, I do not believe that we are free to decide that system claims may never be abstract. The Supreme Court has warned that "patent eligibility [does not] 'depend simply on the draftsman's art.'" *Prometheus*, 132 S.Ct. at 1294 (quoting *Flook*, 437 U.S. at 593, 98 S.Ct. 2522). A bright-line rule would conflict with the Supreme Court's admonition against putting form before substance in this area of patent law. More fundamentally, however, providing all system claims with immunity from the subject matter inquiry would eviscerate the abstract idea test altogether. Any method claim that uses a general purpose computer may also be drafted as a system (containing computers) that carries out the method. The close similarity between the representative system and method claims in this case provides a great example. Thus, I generally agree with the majority that the mere fact that a claim recites a system does not put it beyond the abstract idea test. Maj. Op. 1352.

Once we accept that system claims may be abstract, however, there is little room to suggest that the system claims in this case fall within patentable subject matter. As already mentioned, the Supreme Court has directed us to inquire whether the claim limitations that are added to the abstract idea are inventive. Of course, I do not understand that prescription as a permit to collapse the obviousness and novelty inquiries into § 101. But there are cases where we may simply consult the claims and the specification in order to conclude that the additions are mere pre or post solution activity. That is, there are cases in which we can easily tell that the invention is not about systems or computers; it is merely an abstract idea clothed as something more tangible. In those circumstances, we may not simply defer the threshold question of patentability to other provisions of the Act; rather, where the case squarely presents the issue, we must invalidate the patent under § 101. *See supra* Part I.

This is one such case. Apart from the abstract idea of avoiding transaction risk by using financial intermediaries, representative system claim 1 of the '720 patent recites 1) a computer memory that contains account balance information, '720 patent col.65 ll.42-61. One need not be a computer scientist to suspect that this level of computer implementation is not inventive. But intuition is not our only guide; we also have the patent specification. The "disclosure of the invention" section of the '720 patent almost exclusively discusses the concept of risk minimization in financial transactions. Although it summarily states that "[t]he invention also encompasses apparatus . . . dealing with the handling of contracts," it does not mention what aspect of the apparatus is an advancement in the art. *Id.* col.5 ll.27-29. Quite the opposite: it explains that the object of the invention can be "achieved by a computing/telecommunications infrastructure that is capable of being accessed worldwide by any enterprise/individual having access to a computer and a telephone network." *Id.* col.5 ll.47-50. The rest of the 65-column-long specification is similarly devoid of any teaching for how one must implement computer systems. For example, there is no instruction for connecting various components of the system and no discussion of how existing systems need be modified or improved in order to implement the one that is claimed. Indeed, even the "preferred embodiment" is not limited to a single system: According to the specification, the best mode of the invention may be implemented with "[a] large range of communication hardware products," "[o]ne amongst many of [which] are personal computers and associated printers." *Id.* col.7 l.65-col.8 l.3. Other options include "a mini or mainframe computer," "a tone dialing telephone," or even "a voice connection via an operator." *Id.* col.8 ll.6-12. As far as an actual system is concerned, therefore, implementation is irrelevant—anything goes. Instead, the specification discusses at length and in painful detail various forms of transactions, contracts, order processing, order authorization, risk management, and other financial concepts. Even a quick glance at the '720 patent reveals that the claimed invention is not about physical systems; it is the abstract idea of risk-management in financial transactions carried out on an already known infrastructure. That invention, even if new, is an unpatentable abstract idea.

In sum, if we are to assess system claims for subject matter patentability—and I believe that we are currently so obligated—we must also follow the Supreme Court's instructions on how the abstract idea test should be applied. That is, we must look beyond the non-inventive aspect of the claims and ask whether the remaining portion is an abstract idea. Following that approach, in my view, unavoidably leads to the conclusion that similar to the method claims, the asserted system claims are not patentable. Perhaps, the Supreme Court will reconsider its broad instructions in *Prometheus* once it considers system claims, but until then we would only add confusion and uncertainty by creating our own ad-hoc approach. I respectfully dissent.[2]

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[2] I am also of the view that the computer medium claims are not patentable under § 101. But since the majority has not addressed the issue separately, I see no need to discuss it.

APPENDIX C

UNITED STATES DISTRICT COURT
DISTRICT OF COLUMBIA

Civil Action No. 07-974 (RMC)

CLS BANK INTERNATIONAL,
Plaintiff,

v.

ALICE CORPORATION PTY. LTD.,
Defendant.

March 9, 2011

MEMORANDUM OPINION

ROSEMARY M. COLLYER, District Judge.

CLS Bank International moves for summary judgment, contending that all patent claims asserted by Alice Corporation Pty. Ltd. in this case are invalid under 35 U.S.C. § 101 for lack of patentable subject matter. Alice cross-moves for partial summary judgment, arguing that its asserted claims are directed to patent-eligible subject matter. Before the Court are claims 33 and 34 of U.S. Patent No. 5,970,479, and every claim of U.S. Patent No. 6,912,510; U.S. Patent No. 7,149,720; and U.S. Patent No. 7,725,375. For the reasons set out below, the Court finds each of the claims at issue to be directed to unpatentable subject matter and will grant summary judgment in full to CLS.

I. FACTS

A. The Patents

Alice is an Australian company that owns four United States patents; it asserts that CLS infringes these four patents. CLS is an "Edge Act Corporation," organized under Section 25A of the Federal Reserve Act, as amended, 12 U.S.C. § 611, and authorized by statute to engage in international banking activities. In response to Alice's charge of infringement, CLS challenges the subject matter patentability of the asserted claims of the four patents. Alice's four patents at issue are: (1) U.S. Patent No. 7,149,720 ("'720 Patent"); (2) U.S. Patent No. 6,912,510 ("'510 Patent"); (3) U.S. Patent No. 5,970,479 ("'479 Patent"); and U.S. Patent No. 7,725,375 ("'375 Patent") (collectively the "Patents"). The relevant claims of the '479 and '510 Patents are directed to a method (i.e., process), while the claims of the '720 and '375 Patents are directed to a system or product. The Court has not construed the allegedly infringed claims.

In the early 1990's, the founder of Alice, Ian Shepherd, invented an "innovative trading platform" which entailed a "computerized system for the establishment, settlement, and administration of financial instruments, principally of basic derivatives, that would solve problems inherent in the way such trading had been done in the past." Alice Mem. in Supp. of Mot. for Summ. J. & Opp'n [Dkts. 95, 96] 4 ("Alice Mem."). One aspect of the trading platform is "an automated method and system for eliminating counter-party risk when parties who were often unknown to each other and in different time zones wanted to exchange payments." *Id.* The "electronic settlement mechanism [ ] settled trades without the risk that one party would perform and the other would not." *Id.* Alice's expert, Paul Ginsberg, explains that the Patents "disclose and claim in various ways a novel computerized trading platform for exchanging obligations in which a trusted third party, running a computer system programmed in a specific way, settles parties' obligations so as to eliminate what is variously referred to as 'Herstatt,' 'counterparty,' or 'settlement' risk—the risk that only one party's obligation will be paid, leaving the other party without its principal." *Id.* 4-5 (citing Alice Mem., [Ex. 1] Ginsberg Decl. ¶¶ 23-24). "The trusted third party—a 'supervisory institution'—operates a data processing system that exchanges both parties' obligations or neither." *Id.* at 5.

Mr. Ginsberg elucidates the risk the Patents are intended to mitigate. "When obligations arise from a trade made between two parties, e.g., a trade of stock or a trade of foreign currency, typically, there is a gap in time between when the obligation arises and when the trade is 'settled.'" Ginsberg Decl. ¶ 21. "In a number of financial contexts, the process of exchanging obligations, or settlement, is separate from the process of entering into a contract to perform a trade." *Id.* Mr. Ginsberg provides the example of two banks that wish to exchange large sums of currency would normally enter into a binding agreement to make an enumerated exchange but would postpone the actual exchange until after the price is set and the agreement confirmed, which is typically a two day period. *Id.* ¶ 22. After two days, the two banks would "settle" the trade by both paying their predetermined amounts to the other bank. However, a risk exists that one bank might wire its money, but the second bank would fail to do the same; the loss possibly becoming permanent, for instance, if the second bank thereafter goes bankrupt or is shut down by regulators. *Id.* ¶ 23. The Patent claims at issue here seek to minimize this "settlement" risk that only one side of a trade would be fulfilled during the settlement process. *Id.* "Generally speaking, a trusted third party might operate a computer system that is configured in a particular way to exchange the parties' obligations, and by performing the particular electronic method using that computer system, can lessen settlement risk." *Id.* ¶ 24.

Therefore, Mr. Ginsberg reads the asserted claims of the four Patents to be "generally directed to methods or systems that help lessen settlement risk using a computer system." *Id.* Very broadly speaking, the process claims are directed to methods of exchanging financial obligations between parties while the system claims relate to data processing systems to implement the steps of exchanging obligations and the computer product claims enable a computer to send a transaction to the system to be implemented and allow a user to view the steps of exchanging obligations being performed.

1. '479 Patent

The '479 Patent is entitled "Methods and Apparatus Relating to the Formulation and Trading of Risk Management Contracts." *See* CLS Mem. in Supp. of Mot. for Summ. J. [Dkt. # 94] ("CLS Mem."), [Ex. 1] '479 Patent. The application for the '479 Patent was filed on May 28, 1993, and the Patent issued on October 19, 1999. The '479 Patent, at large, allegedly "discloses a complex computer-based system and various electronic methods for formulating risk management contracts, trading the contracts, and exchanging the resulting obligations." Ginsberg Decl. ¶ 25. The specification discloses:

> The invention encompasses methods and apparatus enabling the management of risk relating to

> specified, yet unknown, future events by enabling entities (parties) to reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent on the occurrence of the specified future events. The entities submit such orders to a 'system' which seeks to price and match the most appropriate counter-party, whereupon matched contracts are appropriately processed through to their maturity. Therefore, the invention enables parties to manage perceived risk in respect of known, yet non-predictable, possible future events.

'479 Patent, col. 3:29-42. The disclosure of the '479 Patent reveals an invention that, as a whole, appears to be directed to a seemingly complex trading platform which facilitates a wide array of parties to come together and enter into contracts to hedge against future risks of all sorts; the system allows parties to trade such contracts already entered into, the system manages contracts until maturity, and the system provides for the transfer or exchange of entitlements or payments once they arise.

Only claims 33 and 34 of the '479 Patent are at issue in this matter. These two claims are directed to a "method of exchanging obligations" between parties, and in their entirety, they claim:

> 33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

(a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;

(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;

(c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and

(d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

34. The method as in claim 33, wherein the end-of-day instructions represent credits and debits netted throughout the day for each party in respect of all the transactions of that day.

'479 Patent, col. 65:23-54. Both claims recite a "shadow credit record," a "shadow debit record," and a "transaction." *See, e.g.*, *id*. col. 65:27, 33 (Claim 33).

The methods in claims 33 and 34 relate to just one feature of the entire invention disclosed in the '479

Patent, *see* Ginsberg Decl. ¶ 26; a concluding step of sorts, when contracted-for obligations become ripe and are exchanged. *See* '479 Patent, col. 5:61-63 (noting the invention "also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement"). The '479 Patent was the first of the Patents to issue and the inventions disclosed by the '510, '720, and '375 Patents are continuations of the '479 Patent which, with only minor differences, share a common specification. *See* Ginsberg Decl. ¶ 25; Alice Mem. 4.

2. '510 Patent

The '510 Patent is entitled "Methods of Exchanging an Obligation." *See* CLS Mem., [Ex. 2] '510 Patent. The application for the '510 Patent was filed on May 9, 2000, and it issued on June 28, 2005. Each of the 75 claims of the '510 Patent is directed to a particular method of exchanging an obligation. For instance, claim 1 of the '510 Patent is directed to:

> 1. A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution, and wherein at least one credit record and one debit record is maintained with an exchange institution, the method comprising:
>
> (a) maintaining a shadow credit record and a shadow debit record for a party to be held independently by the supervisory institution from the exchange institution;
>
> (b) for every transaction resulting in an exchange obligation, the supervisory institution electronically adjusting said shadow credit record and/or shadow debit record, allowing only those transactions that do not result in a

> value of said shadow debit record being less than a value of said shadow credit record; and
>
> (c) at the end of a period of time, the supervisory institution providing an instruction to the exchange institution to credit and/or debit in accordance with said adjustments of said allowed transactions, wherein said instruction being an irrevocable, time invariant obligation placed on the exchange institution.

'510 Patent, col. 64:2-21. Each of the five independent claims—claims 1, 27, 61, 65, and 68—of the '510 Patent calls for "electronically adjusting" records or accounts. *Id.* col. 64:11-12 (Claim 1); *id.* col. 65:25-26 (Claim 27); *id.* col. 66:63-64 (Claim 61); *id.* col. 67:24-25 (Claim 65); *id.* col. 68:7 (Claim 68).

An exchange of obligations, however defined, is the stated purpose of the methods claimed in the '510 Patent claims and claims 33 and 34 of the '479 Patent. Alice argues that claims 33 and 34 of the '479 Patent and every claim of the '510 Patent are implemented electronically using a computer coupled to a data storage method. *See* Ginsberg Decl. ¶¶ 28-43. CLS disputes that these methods directly or indirectly claim the use of a computer.

3. '720 Patent

The '720 Patent is entitled "Systems for Exchanging an Obligation." CLS Mem., [Ex. 3] '720 Patent. The application for the '720 Patent was filed on December 31, 2002, and it issued on December 12, 2006. Each claim of the '720 Patent, claims 1-84, is directed to a particular data processing system.

As a representative example, claim 1 of the '720 Patent is directed to:

> 1. A data processing system to enable the exchange of an obligation between parties, the system comprising:
>
> > (a) data storage unit having stored therein information about a shadow credit record and shadow debit record for a party, independent from a credit record and debit record maintained by an exchange institution; and
> >
> > (a) [sic] computer, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said shadow credit record and/or said shadow debit record in order to effect an exchange obligation arising from said transaction, allowing only those transactions that do not result in a value of said shadow debit record being less than a value of said shadow credit record; and (c) generate an instruction to said exchange institution at the end of a period of time to adjust said credit record and/or said debit record in accordance with the adjustment of said shadow credit record and/or said shadow debit record, wherein said instruction being an irrevocable, time invariant obligation placed on said exchange institution.

'720 Patent, col. 65:42-61. Each of the six independent claims—claims 1, 28, 60, 64, 68, and 80—of the '720 Patent recites "a data storage unit having stored therein" information about accounts or records, and a "computer, coupled to said data storage unit," that is "configured" to perform certain steps. *See id.* col. 65:42-61 (Claim 1); *id.* col. 67:1-18 (Claim 28); *id.* col. 68:33-53 (Claim 60); *id.* col. 68:62-66 & col. 69:1-11 (Claim 64); *id.* col. 69:20-42 (Claim 68); *id.* col. 70:20-37 (Claim 80).

4. '375 Patent

The '375 Patent is entitled "Systems and Computer Program Products for Exchanging an Obligation." CLS Mem., [Ex. 4] '375 Patent. The application leading to the '375 Patent was filed on June 27, 2005, and it issued on May 25, 2010. Claims 1-38 and 42-47 of the '375 Patent are directed to data processing systems which enable the exchange of an obligation. As with the '720 Patent claims, the three independent system claims—claims 1, 14, and 26-of the '375 Patent each requires "a data storage unit having stored therein" information about accounts or records, and a "computer, coupled to said data storage unit," that is "configured" to perform certain steps. *See* '375 Patent, col. 65:1-30 (Claim 1); *id.* col. 66:1-29 (Claim 14); *id.* col. 66:61-65 & col. 67:1-26 (Claim 26). The '375 Patent incorporates additional elements to the systems claimed in the '720 Patent. For instance, independent claim 1 further recites a "first party device," *id.* col. 65:4, claim 12 adds a "second party device," *id.* col. 65:62, and claim 14 recites a "communications controller." *Id.* col. 66:3.

Independent claim 39 and claims 40 and 41, which depend from claim 39,[1] of the '375 Patent are, on the other hand, directed to computer program products containing particular program code.

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[1] "[A] claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." 35 U.S.C. § 112. In other words, a dependent claim incorporates all of the limitations of the claim from which it "depends" and adds something new; thus, a dependent claim has a narrower scope than the claim from which it depends. Further, "the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed.Cir.2005).

Claim 39 of the '375 Patent is directed to:

> 39. A computer program product comprising a computer readable storage medium having computer readable program code embodied in the medium for use by a party to exchange an obligation between a first party and a second party, the computer program product comprising:
>
> > program code for causing a computer to send a transaction from said first party relating to an exchange obligation arising from a currency exchange transaction between said first party and said second party; and
> >
> > program code for causing a computer to allow viewing of information relating to processing, by a supervisory institution, of said exchange obligation, wherein said processing includes (1) maintaining information about a first account for the first party, independent from a second account maintained by a first exchange institution, and information about a third account for the second party, independent from a fourth account maintained by a second exchange institution; (2) electronically adjusting said first account and said third account, in order to effect an exchange obligation arising from said transaction between said first party and said second party, after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and (3) generating an instruction to said first exchange institution and/or said second exchange institution to adjust said second

> account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

Id. col. 68:5-35. Thus, each of the three product claims asserts a "computer readable storage medium" and "computer readable program code embodied in the medium." *Id.* col. 68:5-7 (Claim 39).

B. Procedural History

On May 24, 2007, CLS brought suit against Alice, seeking a declaratory judgment of non-infringement, patent invalidity, and patent unenforceability under the Patent Act, 35 U.S.C. § 1 *et seq.*, and the Declaratory Judgment Act, 28 U.S.C. §§ 2201, 2202. On August 16, 2007, Alice counter claimed that CLS was infringing three of its patents: the '479, '510, and '720 Patents. By agreement of the parties, initial discovery commenced on the question of (1) the operation of CLS Bank International, and (2) CLS Bank International's relationship with the CLS system.

In March 2009, CLS moved for summary judgment on the basis that (a) any patent infringement by CLS could not be said to be occurring within the United States and (b) Alice's claims lacked patentable subject matter eligibility. Alice opposed and cross-moved on both issues. As for extraterritoriality, on October 13, 2009, 667 F.Supp.2d 29 (D.D.C.2009), the Court denied CLS's motion, finding that U.S. patent laws reached CLS's alleged infringing acts since CLS both "uses" its CLS Core System and "offers to sell, or sells" its methods within the United States. The Court also denied without prejudice Alice's cross-motion as premature since it sought a declaration of infringement. *See* Redacted Mem. Op. & Order [Dkt. 79, 78]. The Court then certified CLS's immediate appeal, but the United States Court of Appeals for the Federal Circuit denied CLS's request for an interlocutory appeal. *See* Federal Circuit Order [Dkt. # 87].

On June 16, 2009, the Court denied without prejudice the cross-motions on subject matter eligibility on the grounds that the Supreme Court had granted certiorari in ***In re Bilski***, 545 F.3d 943 (Fed.Cir.2008) (en banc) ("***Bilski I***"), upon which the parties had relied heavily in their briefing. The Court ordered re-filing for after the Supreme Court issued its decision. *See* Minute Entry Order 6/16/2009. After the Supreme Court issued ***Bilski v. Kappos***, — U.S. —, 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010) ("***Bilski II***"), the parties renewed their briefs. Further, on August 5, 2010, the Court granted Alice leave to file an amended answer containing an additional counterclaim charging CLS with infringement of its '375 Patent, which had only been issued three months prior. Briefing on the question of whether Alice's claims at issue in this litigation are directed to patent eligible subject matter under the Patent Act is now ripe, after oral argument was held on January 14, 2011.

II. LEGAL STANDARD

A. Summary Judgment

Under Rule 56 of the Federal Rules of Civil Procedure, summary judgment shall be granted "if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed.R.Civ.P. 56(a); ***Anderson v. Liberty Lobby, Inc.***, 477 U.S. 242, 247, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986). Moreover, summary judgment is properly granted against a party who "after adequate time for discovery and upon motion . . . fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial." *Celotex Corp. v. Catrett*, 477 U.S. 317, 322, 106 S.Ct. 2548, 91 L.Ed.2d 265 (1986).

In ruling on a motion for summary judgment, the court must draw all justifiable inferences in the nonmoving party's favor and accept the nonmoving party's evidence as true. *Anderson*, 477 U.S. at 255, 106 S.Ct. 2505. A nonmoving party, however, must establish more than "the mere existence of a scintilla of evidence" in support of its position. *Id.* at 252, 106 S.Ct. 2505. In addition, the nonmoving party may not rely solely on allegations or conclusory statements. *Greene v. Dalton*, 164 F.3d 671, 675 (D.C.Cir.1999). Rather, the nonmoving party must present specific facts that would enable a reasonable jury to find in its favor. *Id.* at 675. If the evidence "is merely colorable, or is not significantly probative, summary judgment may be granted." *Anderson*, 477 U.S. at 249-50, 106 S.Ct. 2505 (citations omitted).

B. Subject Matter Eligibility under the Patent Act

Section 101 of the Patent Act delineates which inventions are patentable: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. Congress created four independent categories of inventions or discoveries that are eligible for patent protection: processes, machines, manufactures, and compositions of matter. A "process" is defined in the Patent Act as a "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material." *Id.* § 100(b). The Supreme Court has described a "process" as follows:

> That a process may be patentable, irrespective of the particular form of the instrumentalities used, cannot be disputed. . . . A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result. The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.

Diamond v. Diehr, 450 U.S. 175, 182-83, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981) (quoting *Cochrane v. Deener*, 94 U.S. 780, 787-88, 24 L.Ed. 139 (1877)).

By writing § 101 in expansive terms, "Congress plainly contemplated that the patent laws would be given wide scope." *Diamond v. Chakrabarty*, 447 U.S. 303, 308, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980). "Congress took this permissive approach to patent eligibility to ensure that ingenuity should receive a liberal encouragement." *Bilski II*, 130 S.Ct. at 3225 (internal quotation marks omitted); *In re Comiskey*, 554 F.3d 967, 977 (Fed.Cir.2009) (recognizing that patentable subject matter under § 101 is "extremely broad"). In fact, the Supreme Court has "more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed." *Bilski II*, 130 S.Ct. at 3226 (quoting *Diehr*, 450 U.S. at 182, 101 S.Ct. 1048 (internal quotation marks omitted)).

The Supreme Court has enunciated three exceptions to the Patent Act's broad subject matter eligibility framework: "laws of nature, physical phenomena, and abstract ideas." *Bilski II*, 130 S.Ct. at 3225 (quoting *Chakrabarty*, 447 U.S. at 309, 100 S.Ct. 2204). Thus, even if an invention appears to nominally claim subject matter that would be statutorily covered by the Patent Act, it will be denied patent protection if it falls into one of the "fundamental principles" exceptions, i.e. a law of nature, natural phenomena, and/or an abstract idea, which have been expounded by the Supreme Court in *Gottschalk v. Benson*, 409 U.S. 63, 93 S.Ct. 253, 34 L.Ed.2d 273 (1972), *Parker v. Flook*, 437 U.S. 584, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978), *Diehr*, 450 U.S. 175, 101 S.Ct. 1048, and most recently *Bilski II*, 130 S.Ct. 3218. An underlying reason for these exceptions is that "[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67, 93 S.Ct. 253; *accord Diehr*, 450 U.S. at 185, 101 S.Ct. 1048 ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.") (citation omitted). Although the "fundamental principles" exceptions are not statutory, the Supreme Court has found them to be consistent with the requirement that a patentable invention be "new and useful." *Bilski II*, 130 S.Ct. at 3225 (citing 35 U.S.C. § 101). The Supreme Court recently emphasized that a lower court should be attentive to the "guideposts" of *Benson*, *Flook*, and *Diehr* when considering these exceptions to subject matter patentability. *Id.* at 3231.

In 1972, the *Benson* Court held that a method of programming a computer to convert binary-coded decimal numerals to their equivalent pure binary numerals was not a "process" as covered by the Patent Act. The Court found the method truly claimed an "algorithm," as it represented a general formulation for computers to solve the mathematical problem of converting one numerical representation to another, which merely constituted an algorithm from which specific applications could be developed. *Benson*, 409 U.S. at 65, 93 S.Ct. 253. The Court held that the *Benson* patent would preempt the use of the algorithm by others as the claim could cover known and future unknown uses of the code conversion formula in many different fields and for many different purposes, and effectively preempt its use in existing machinery, future-devised machinery, or no machinery at all. *Id.* at 68, 93 S.Ct. 253. The Court also found that the computer failed to limit the invention since the algorithm had no practical application except in connection with a computer; therefore a patent on the invention served as a patent on the algorithm itself. *Id.* at 71-2, 93 S.Ct. 253.

In 1978, the *Flook* Court rejected another patent because it was directed to unpatentable subject matter, another algorithm, although the patent contained greater limitations and entailed a more specific application than the patent in *Benson*. The *Flook* patent concerned monitoring conditions during catalytic conversion processes in the petrochemical and oil-refining industries, and the claims were directed to a method of computing an alarm limit, which is the point at which catalytic conversion conditions can produce inefficiencies or danger. The Court recognized that the only novel part of the method was that it employed a new mathematical formula for calculating and/or updating the alarm limit, and that the invention really claimed the algorithm itself. *Flook*, 437 U.S. at 585-86, 98 S.Ct. 2522. That the claims were limited to the petrochemical and oil-refining industries and would therefore not preempt the wholesale use of the algorithm was insufficient to render the claims patentable. *Id.* at 589-90, 98 S.Ct. 2522. Likewise, the methods were not saved by the "post-solution" activity of adjusting the actual alarm limit based on the results of the algorithm since a "competent draftsman could attach some form of post-solution activity to almost any mathematical formula." *Id.* at 590, 98 S.Ct. 2522

In 1981, the Supreme Court colored the outer limits of the fundamental principles exceptions in *Diehr*, in which the Court upheld the subject matter eligibility of a claim to a process for producing cured synthetic rubber products. While the invention employed a well-known mathematical formula in one of its steps, the patent did not seek to preempt the use of the formula itself, but only preempt its use in conjunction with all the other steps in the claimed method. *Diehr*, 450 U.S. at 187, 101 S.Ct. 1048. Admittedly, the mathematical formula would not be patentable on its own, "but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by § 101." *Id.* at 188, 101 S.Ct. 1048. The Court distinguished *Flook* by explaining: "We were careful to note in *Flook* that the patent application did not purport to explain how the variables used in the formula were to be selected, nor did the application contain any disclosure relating to chemical processes at work or the means of setting off an alarm or adjusting the alarm limit. All the application provided was a 'formula for computing an updated alarm limit.'" *Id.* at 192 n. 14, 101 S.Ct. 1048 (internal citations omitted).

Most recently, in 2010, the Supreme Court found a business method unpatentable as directed to an abstract idea. *See Bilski II*, 130 S.Ct. at 3231. The *Bilski II* Court invalidated process claims generally directed to instructing buyers and sellers how to hedge risk and how to apply the methods to the energy commodities market. *Id.* The Court pointed out that hedging is a "fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class." *Id.* (citation omitted). "Allowing petitioners to patent risk hedging would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea." *Id.* The Court also found the dependent claims applying the methods of hedging risk to the energy commodities market unpatentable as vain attempts to limit an fundamental concept to a particular field of use or to add post-solution components. *Id.* The Court found that the patent claims "attempt to patent the use of the abstract idea of hedging risk in the energy market and then instruct the use of well-known random analysis techniques to help establish some of the inputs into the equation." *Id.* In fact, "these claims add even less to the underlying abstract principle than the invention in *Flook* did, for the *Flook* invention was at least directed to the narrower domain of signaling dangers in operating a catalytic converter." *Id.*

While an abstract idea in itself is not patentable, a claim "is not unpatentable simply because it contains a law of nature or a mathematical algorithm." *Flook*, 437 U.S. at 590, 98 S.Ct. 2522. "It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Diehr*, 450 U.S. at 187, 101 S.Ct. 1048 (emphasis in original); *id*. at 192, 101 S.Ct. 1048 ("[W]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101."). It is also clear that when a court examines whether a claim is directed to an abstract idea, the court must view each claim as a whole. "In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole . . . This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made." *Diehr*, 450 U.S. at 188, 101 S.Ct. 1048; *see also King Pharms., Inc. v. Eon Labs., Inc.*, 616 F.3d 1267, 1277 (Fed.Cir.2010) (reasserting that "§ 101 patentability analysis is directed to the claim as a whole, not individual limitations" within the claim).

There is no clear definition of what constitutes an abstract idea; instead, courts analogize from the standards etched out by the cases just discussed. As the Federal Circuit recently acknowledged, "the Supreme Court did not presume to provide a rigid formula or definition for abstractness." *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859, 868 (Fed.Cir.2010) (citing *Bilski II*, 130 S.Ct. at 3238). The Federal Circuit declined to "presume to define 'abstract' beyond the recognition that this disqualifying characteristic should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act." *Id.*

Ultimately, the determination of whether an asserted claim is invalid for lack of subject matter patentability under § 101 is a question of law. *See Bilski I*, 545 F.3d at 950. A patent is presumed to be valid by statute, 35 U.S.C. § 282; therefore, a patent challenger bears the burden of proving invalidity by clear and convincing evidence. *See Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1359 (Fed.Cir.2007). This standard of proof applies equally at summary judgment. *See National Presto Indus. v. West Bend Co.*, 76 F.3d 1185, 1189 (Fed.Cir.1996). While invalidity is a question of law, "determination of this question may require findings of underlying facts specific to the particular subject matter and its mode of claiming." *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1056 (Fed.Cir.1992).

Whether an invention falls within a subject matter eligible for § 101 protection is also a threshold question. *See Comiskey*, 554 F.3d at 975. "It is well-established that '[t]he first door which must be opened on the difficult path to patentability is § 101.'" *Id.* at 973 (quoting *State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1372 n. 2 (Fed.Cir.1998)). Only after an invention has satisfied § 101, will it be analyzed under the remaining hurdles of the Patent Act, which include the requirement that an invention be novel, *see* § 102; nonobvious, *see* § 103;

and fully and particularly described, *see* § 112. *See Bilski II*, 130 S.Ct. at 3225.[2]

III. ANALYSIS

CLS argues that Alice's claims are not patentable because they are directed to an abstract idea—the exchange of an obligation when sufficient value is present—which is supported by its argument that the method claims fail to satisfy the machine-or-transformation test. Thus, CLS posits that Alice's method claims in the '510 Patent and claims 33 and 34 of the '479 Patent are directed to an abstract idea, and then by the draftsman's art, this abstract idea is recast as computer system and product claims in the '720 and '375 Patents to carry out the same methods. CLS argues this is further evidenced by the fact the Patents share essentially the same specification and disclosure.

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[2] The Federal Circuit recently explained, in overturning a district court's finding that a method claim was abstract, that

> an invention which is not so manifestly abstract as to override the statutory language of section 101 may nonetheless lack sufficient concrete disclosure to warrant a patent. In section 112, the Patent Act provides powerful tools to weed out claims that may present a vague or indefinite disclosure of the invention. Thus, a patent that presents a process sufficient to pass the coarse eligibility filter may nonetheless be invalid as indefinite because the invention would 'not provide sufficient particularity and clarity to inform skilled artisans of the bounds of the claim.' *Star Scientific., Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1371 (Fed.Cir.2008). That same subject matter might also be so conceptual that the written description does not enable a person of ordinary skill in the art to replicate the process.

Research Corp., 627 F.3d at 869.

A. Method Claims

CLS first attacks claims 33 and 34 of the '479 Patent and every claim of the '510 Patent—which collectively entail the only method claims at issue in this litigation—arguing these method claims fail as abstract and because they fail to meet the machine-or-transformation test. Alice responds that the methods are not abstract, but a functional application of a method to satisfy a need, and that the claims further satisfy the machine-or-transformation test.

1. Statutory Category

The first question is whether the methods in claims 33 and 34 of the '479 Patent and all claims in the '510 Patent statutorily qualify for patent protection. Congress broadly defined the categories of inventions to be afforded patent protection to ensure that "ingenuity should receive a liberal encouragement." *Chakrabarty*, 447 U.S. at 308-09, 100 S.Ct. 2204. The Patent Act defines "process" as a "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material." 35 U.S.C. § 100(b). The relevant claims of the '479 and '510 Patents are directed to particular methods, or steps, of exchanging obligations. Thus, the claims nominally satisfy the statutory language of § 101 and the process definition laid out in § 100(b). However, the analysis does not end here as the machine-or-transformation test helps guide a court in the decision as to whether a process is subject matter eligible under the Patent Act.

2. Machine-or-Transformation Test

To determine whether a process claims subject matter that is patent eligible, a court may look to the useful and important "machine-or-transformation"

("MOT") test for guidance. *See Prometheus Labs., Inc. v. Mayo Collaborative Servs. & Mayo Clinic Rochester*, 628 F.3d 1347, 1355 (Fed.Cir.2010). Under the MOT test, an invention is a process if "(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." *Bilski I*, 545 F.3d at 954. Further, "the use of a specific machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility" and "the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity." *Id.* at 961-62. The MOT test is neither the exclusive nor the dispositive standard to determine whether an invention qualifies as a process under § 101, yet it remains a "useful and important clue, an investigative tool" in the analysis. *Bilski II*, 130 S.Ct. at 3227. Therefore, this Court analyzes the claims under the MOT analysis to inform its ultimate finding.

The Court first finds the relevant claims of the '479 and '510 Patents do not involve any "transformation" under the MOT test. Alice argues that the electronic transformation of data caused by the methods' electronic adjustment of accounts satisfies the transformation prong of the test. *See* Alice Mem. 33. The Federal Circuit recently grappled with its "measured approach" to allowing the manipulation of electronic signals or data or even "abstract constructs," such as legal obligations, to qualify as transformations under the Patent Act. *Bilski I*, 545 F.3d at 962. The Federal Circuit pointed to only one example where "the electronic transformation of the data itself into a visual depiction" was sufficient to meet the test. *Id.* at 963 (citing *In re Abele*, 684 F.2d 902, 908-09 (C.C.P.A.1982)). It was not the mere manipulation of data itself that led the U.S. Court of Customs and Patent Appeals (the predecessor to the U.S. Court of Appeals for the Federal Circuit) to find the method was transformative, but that the process involved the conversion of X-ray data into a visual depiction which represented specific physical objects, i.e., bones. *See Bilski I*, 545 F.3d at 962-63.[3] Taken to the extreme, Alice's argument would convert almost any use of a computer, or other electronic device with memory, to a transformation under the MOT test simply because data would necessarily have to be manipulated, and on a microscopic level, a hard drive, for instance, would be "transformed" by the process of "magnetizing or demagnetizing part of a hard disk drive platter corresponding to a bit of data." *See* Alice Mem. 33.

Further, for a transformation to satisfy the MOT test, the "transformation must be central to the purpose of the claimed process." *Bilski I*, 545 F.3d at 962. Assuming the asserted process claims in the Patents are implemented by computer, the claims are nonetheless directed to "a method of exchanging obligations," not to the manipulation of an electronic hard drive or memory, and any such electronic transformation is at most incidental to the exchange of obligations, not to mention it would also constitute insignificant extra-solution activity. Further, the exchange of "obligations" itself involves no particular article being transformed since obligations are a mere abstraction. "Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances." *Bilski I*, 545 F.3d at 963.[4] The method claims before the Court, that is, every claim of the '510 Patent and claims 33 and 34 of the '479 Patent, fail to transform any article under the machine-or-transformation test.

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[3] Alice cites to *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed.Cir.1992), as further support that the method claims before the Court involve a transformation under the MOT test. In *Arrhythmia* the Federal Circuit found the conversion, application, determination, and comparison of electrocardiograph signals to be "physical process steps that transform one physical, electrical signal into another" and, accordingly that the process satisfied the second step of the *Freeman-Walter-Abele* test—which requires that an algorithm be applied to physical elements or process steps to be patent eligible. *Id.* at 1059. This analysis is inapposite. First, the Federal Circuit's analysis was not related to the MOT test. Second, the Circuit has since found the *Freeman-Walter-Abele* test to be an inadequate indicator of subject matter patentability and has warned that portions of prior decisions relying solely on this test should no longer be relied upon. *Bilski I*, 545 F.3d at 959 n. 17. The *Bilski I* Court clarified that "the proper inquiry under § 101 is not whether the process claim recites sufficient "physical steps," but rather whether the claim meets the machine-or-transformation test." *Id.* at 961 (referring to the 'physical steps' test developed in *In re Comiskey*, 499 F.3d 1365 (Fed.Cir.2007)).

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[4] Similarly, a district court found a method directed towards discovering credit card fraud did not meet the transformation prong of the MOT test, despite the manipulation of credit information, because no article or physical object was transformed. The credit card number and the card itself were found to represent merely "a common underlying abstraction—a credit card account, which is a series of rights and obligations" existing between the account holder and card issuer. *CyberSource Corp. v. Retail Decisions, Inc.*, 620 F.Supp.2d 1068, 1074 (N.D.Cal.2009). Although the credit card information manifests in a physical credit card, the district court noted: "Options like those described in the *Bilski* patent do not simply float in the ether. A piece of paper upon which the terms of an option are written is, like a credit card, a physical object. Yet this connection to a physical medium does not create patent eligibility, because an option ultimately represents the abstraction of a legal obligation or business risk." *Id.*

The closer question is whether Alice's process claims are tied to a particular machine or apparatus under the MOT test. A "machine" is a "a concrete thing, consisting of parts, or of certain devices and combination of devices." *In re Nuijten*, 500 F.3d 1346, 1355 (Fed.Cir.2007) (quoting *Burr v. Duryee*, 68 U.S. (1 Wall.) 531, 570, 17 L.Ed. 650 (1863)). The Court first looks to the '510 Patent claims, each of which recites "electronically adjusting" records and/or accounts as a step within the claim.[5] The Court has yet to construe the terms of these claims, but CLS concedes for purposes of these motions that the recitation of "electronically adjusting" by each of the '510 Patent claims means that the claims require the use of a computer. CLS Opp'n & Reply in Supp. of Mot. for Summ. J. [Dkt. 97, 98] ("CLS Reply") at 11 n. 6.

The Court will also presume, for purposes of these motions, that claims 33 and 34 of the '479 Patent are directed to computer implementation, a position CLS contests. To be sure, claims 33 and 34 of the '479 Patent contain no unambiguous reference to a machine or apparatus. Alice posits that a person of ordinary skill in the relevant art reading these claims in light of the specification and other claims of the '479 Patent would understand the term "transaction" to require the use of electronic data processing systems, *see* Alice Reply in Supp. of Mot. for Summ. J. [Dkt. # 99] ("Alice Reply") 23, and the terms "shadow credit record" and "shadow debit record" to require electronic storage of data files in a data storage unit. *Id.* (citing Ginsberg Decl. ¶ 32); *see also* '479 Patent, col. 65:27, 33 (Claim 33). At a minimum, Alice argues that claims 33 and 34 are directed to implementation by a computer system including a processor and memory. *See* Alice Mem. 31; *see also* Ginsberg Decl. ¶ 43 (noting that the process claims "expressly recite methods of performing a particular transaction electronically, which requires (explicitly or implicitly) the use of a computer system").

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[5] *See* '510 Patent, col. 64:11-12 (Claim 1); *id.* col. 65:25-26 (Claim 27); *id.* col. 66:63-64 (Claim 61); *id.* col. 67:24-25 (Claim 65); *id.* col. 68:7 (Claim 68) (collectively, the five independent claims of the '510 Patent).

Whether a claim is valid under § 101 is a matter of claim construction, *see State Street*, 149 F.3d at 1370, and for purposes of these motions, CLS has agreed to assume a construction of terms favorable to Alice.[6] The specification for the '479 Patent reveals that the invention entails systems and methods to be realized through the use of a computer with specific programming. *See, e.g.*, '479 Patent, col. 4:24-42; *see also* Ginsberg ¶ 29 ("The entire patent is directed to computer systems and the software applications, e.g., 'CONTRACT APPS,' needed to perform the methods described in the patent."). However, claims 33 and 34 are independent of the broader, more intricate trading platform system revealed in the specification and claimed by the '479 Patent. However, because the relevant terms of claims 33 and 34 of the '479 Patent have yet to be construed, because CLS has agreed to a broad construction of terms favorable to Alice, and because the specification reveals a computer-based invention, the Court can reasonably assume for present purposes that the terms "shadow" credit and/or debit record and "transaction" in the '479 Patent recite electronic implementation and a computer or an analogous electronic device.

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[6] To have the Court consider CLS's § 101 defense before conducting a possible Markman hearing, *see Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996), CLS agreed to assume a construction of claims favorable to Alice. *See, e.g.*, Alice Mem., [Ex 6] Tr. of Aug. 6, 2010 Status Conference at 12:22-25 (reflecting that counsel for CLS stated: "I will say even as to *Markman* our briefing will assume a broad construction favorable to Alice, so we're going to assume that in arguing whether this is really a patentable subject mater or not so that we can expedite that").

The single fact that Alice's method claims are implemented by computer does not mean the methods are tied to a particular machine under the MOT test. The requirement that shadow accounts and/or records be adjusted electronically, or that information be stored electronically, may not sufficiently tie the claims to a particular machine or apparatus that imposes meaningful limits on the claims' scope. *See* CLS Reply 10. At what point does a method that is to be implemented by computer become sufficiently tied to a *particular* computer, so that it satisfies the machine prong of the MOT test? This question has not been clearly answered by the Federal Circuit or the Supreme Court. *See, e.g.*, *Bilski I*, 545 F.3d at 962 ("We leave to future cases the elaboration of the precise contours of machine implementation, as well as the answers to particular questions, such as whether or when recitation of a computer suffices to tie a process claim to a particular machine.").

The Court concludes that nominal recitation of a general-purpose computer in a method claim does not tie the claim to a particular machine or apparatus or save the claim from being found unpatentable under § 101. *See, e.g., Fuzzysharp Techs., Inc. v. 3D Labs Inc.*, Ltd., No. 07-5948, 2009 WL 4899215, at *4, 2009 U.S. Dist. LEXIS 115493, *12 (N.D.Cal. Dec. 11, 2009)

("Courts applying *Bilski* have concluded that the mere recitation of 'computer' or reference to using a computer in a patent claim us [sic] insufficient to tie a patent claim *to a particular machine*.") (emphasis in original) (referring to *Bilski I*, 545 F.3d 943); *Cf. Benson*, 409 U.S. 63, 93 S.Ct. 253 (finding method claims to be performed on a general purpose computer to be invalid as an algorithm). On the other hand, a computer that has been specifically programmed to perform the steps of a method may no longer be considered a general purpose computer, but instead, a particular machine. *Cf. In re Alappat*, 33 F.3d 1526, 1545 (Fed.Cir.1994) (finding that "a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software").

With evolving guidance on this issue, district courts have determined that a method claim that is directed to a general purpose computer is not tied to a particular machine under the MOT test.[7] *See, e.g., Fuzzysharp*, 2009 WL 4899215 at *4, 2009 U.S. Dist. LEXIS 115493 at *12 ("The salient question is not whether the claims are tied to a computer. Rather, as *Bilski* makes clear, the question is whether the claims are tied *to a particular machine*.") (citing *Bilski I*, 545 F.3d at 961) (emphasis in original). In *DealerTrack*, a district court found asserted claims directed to a "computer aided method" of managing a credit application to be invalid under § 101. *DealerTrack, Inc. v. Huber*, 657 F.Supp.2d 1152 (C.D.Cal.2009). The court found the method at issue was not tied to a particular machine because the patent failed to specify how the hardware and database recited were "specially programmed" to implement the method, and the claimed central processor was "nothing more than a general purpose computer that has been programmed in some unspecified manner." *Id.* at 1156; *see also Accenture Global Servs. GmbH v. Guidewire Software, Inc.*, 691 F.Supp.2d 577, 597 (D.Del.2010) (suggesting that a method conducted by a "data processing system," which also claimed a "claim folder," "display device," and "screen," was not tied to a particular computer per the MOT test because the terms failed to "imply a specific computer having any particular programming—they are descriptive of a general computer system at best").

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[7] While a few of the cases cited for this proposition were decided before the Supreme Court issued *Bilski II*, that decision did not touch upon the contours of when a method claim is tied to a particular machine or apparatus under the MOT test. The Court's decision did, of course, dethrone the MOT test as the exclusive test for process patentability under § 101. Thus, while some of these earlier lower-court decisions may have based their holdings entirely upon the results of their application of the MOT test, something against which the Supreme Court has now spoken, the analysis of these decisions as to when a method is tied to a particular machine or apparatus itself remains unaltered after *Bilski II*.

The *Fuzzysharp* court also found certain method claims were not tied to a particular machine. The claims at issue related to "reducing the indivisibility related computations in 3-D graphics" and the district court accepted that the claims required a device such as a computer because at least one claim recited "computer storage," and the parties agreed that certain terms required a "computer screen." *Fuzzysharp*, 2009 WL 4899215 at *3-4, 2009 U.S. Dist. LEXIS 115493 at *11-12. Nonetheless the court found that the claims were not tied to a particular machine because they either contained only a "passing reference to 'computer storage' " or simply made "a general [ ] reference to 'a' computer." *Id.* at *4, 2009 U.S. Dist. LEXIS 115493 at

*12-15. The court noted that ultimately the challenged method claims employed algorithms and calculations which would require a computer, but no particular computer. *Id.* at *5, 2009 U.S. Dist. LEXIS 115493 at *15.[8]

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[8] In light of *Bilski I* and *Bilski II*, the Board of Patent Appeals and Interferences has shown a similar inclination. *See, e.g.*, *Ex Parte Monk*, No. 2009-013250, 2010 WL 5477256, *3 (B.P.A.I. Dec. 30, 2010) (finding claims directed to a method of monitoring credit fraud not tied to a particular machine per the MOT test because the recitation of "analysis engines and a global negative file" represented "at most, the use of a general computer" since the specification disclosed that any microprocessor based system capable of monitoring ongoing credit activity and/or authorizing activity in response could form the analysis engines, and the global negative files could be stored on any general purpose computer); *Ex Parte Kuno*, No. 2009-006896, 2010 WL 5127425, *10 (B.P.A.I. Dec. 13, 2010) ("Although the preamble of claim 1 calls for a 'processor-based' method, the body of the claim recites no structure at all, let alone a particular machine to which the recited process is tied. But even if a processor were recited in the body of the claim, such a nominal structural recitation would be a tantamount to a general purpose computer and would not tie the process to a particular machine or apparatus."); *Ex Parte Myr*, No. 2009-005949, 2009 WL 3006497, *9-10 (B.P.A.I. Sept. 18, 2009) (finding method claims unpatentable, in part, because claims which used the phrase "computer-implemented" only tied the process to "any general-purpose computer" and the recitation "method executed in a computer apparatus" is "so generic as to encompass any computing system, such that anyone who performed this method in practice would fall within the scope of these claims"); *Ex Parte Nawathe*, No. 2007-3360, 2009 WL 327520, *4 (B.P.A.I. Feb. 9, 2009) (rejecting under § 101 claims reciting a computerized method of inputting and representing XML documents since the "computerized recitation purports to a general purpose processor [ ] as opposed to a particular computer specifically programmed for executing the steps of the claimed method"); *but see Ex Parte Kohda*, No. 2009-006262, 2010 WL 4780565, *3 (B.P.A.I. Nov. 22, 2010) (remanding to patent examiner for further findings and suggesting that under the

To determine whether a machine is particular under the MOT test, courts also look to whether the machine or apparatus imposes meaningful limits on the process itself. "In order for the addition of a machine to impose a meaningful limit on the scope of a claim, it must play a significant part in permitting the claimed method to be performed, rather than function solely as an obvious mechanism for permitting a solution to be achieved more quickly, i.e., through the utilization of a computer for performing calculations." *SiRF Tech., Inc. v. ITC*, 601 F.3d 1319, 1333 (Fed.Cir.2010). A machine meaningfully limits a method when the machine is "essential to the operation of the claimed methods." *Id.* In *SiRF Tech.*, decided before *Bilski II*, the Federal Circuit held that claimed methods for teaching a GPS receiver an improved manner in which to calculate its position were tied to a particular machine. *Id.* The Federal Circuit underscored the fact that the machine imposed meaningful limits on the methods since the methods could not be performed without the machine itself—the GPS receiver—and there was no evidence that the calculations required by the claims could be performed entirely in the human mind. *Id.* at 1332-33; *see also CyberSource Corp. v. Retail Decisions, Inc.*, 620 F.Supp.2d 1068, 1077 (N.D.Cal.2009) (finding a method for detecting fraud in credit card transactions over the Internet directed to unpatentable subject matter as the method was not limited to a particular machine, in part, because the process could occur offline: "To give but

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broadest reasonable construction the claims could be read to recite a particular apparatus under the MOT test since they claimed an electronic shopping cart—which appears to collect information on customers purchases thereby targeting advertisements the customers would see).

one example, a merchant taking an order over the telephone could use records or databases to cross-check all credit card numbers associated with that telephone number").

Similarly, in *Every Penny Counts*, a district court invalidated a method claim because it failed the MOT test. *See Every Penny Counts, Inc. v. Bank of Am. Corp.*, No. 2:07-042, 2009 WL 6853402, 2009 U.S. Dist. LEXIS 53626 (M.D.Fla. May 27, 2009). The claim was directed to a system in which a consumer could have a portion of any credit or debit transaction set aside—that amount determined either by rounding up each transaction to the nearest dollar and setting aside the difference or by adding a predetermined amount to each transaction—and then have the portion routed to either the consumer's savings account, a preferred charitable organization, or a portion to each. *Id.* at *1, 2009 U.S. Dist. LEXIS 53626 at *2. The district court first found the claim, categorized as a system, to be truly directed to a process since it "has no substantial practical application except in connection with computers, cash registers, and networks, but it is not comprised of those devices." *Id.* at *2, 2009 U.S. Dist. LEXIS 53626 at *7 (internal quotation marks omitted). The court then found that although the process recited implementation by a "network," "entry means" and a "computing means in said network being responsive to said data," the so-described computer failed to impose a meaningful limitation on the process because the claim was essentially "a mathematical algorithm [that] uses machines for data input and data output and to perform the required calculations." *Id.* at *3, 2009 U.S. Dist. LEXIS 53626 at *7.

Granting Alice's position that "claims 33 and 34 of the '479 patent are properly limited to implementations of the claim methods using a computer, just as the '510 patent requires," *see* Alice Mem. 32 n. 15, the Court nonetheless finds the method claims before the Court—claims 33 and 34 of the '479 Patent and each claim of the '510 Patent—are not tied to a particular machine under the MOT test. Assuming accounts and/or records will be electronically adjusted, which requires information to be stored electronically in a data storage unit, and that an irrevocable instruction is conducted electronically, the method claims here at best recite implementation by a general-purpose computer.[9]

The claims before the Court at most implicitly recite a computer by claiming electronic adjustment of records or accounts.[10] This contrasts with other cases in which district courts found methods were not tied to a particular machine and were unpatentable under § 101 despite explicit recitation of hardware or computer components. *See, e.g., Every Penny*, 2009 WL 6853402 at *2-3, 2009 U.S. Dist. LEXIS 53626 at *7 (reciting "network," "entry means" and "computing means in said network being responsive to said data"); *Fuzzysharp*, 2009 WL 4899215 at *4, 2009 U.S. Dist. LEXIS 115493 at *12 (reciting "computer" and "computer storage"); *DealerTrack*, 657 F.Supp.2d at 1153 (reciting, *inter alia*, "computer aided method" and "remote application entry and display device"); *Accenture Global Servs.*, 691 F.Supp.2d at 597 (suggesting, but not holding, that claims reciting "data processing system," "claim folder," "display device," and "screen" were not patentable).

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[9] Alice holds up *AT & T Corp. v. Excel Commc'ns*, 172 F.3d 1352 (Fed.Cir.1999), and, again, Arrhythmia to dispute the need for a claim to recite more than a processor and a memory in order to be tied to a particular machine. However, the *Arrhythmia* Court did not conduct its analysis under the MOT test, nor did the case base its finding on the interconnectedness between a method claim and electronic equipment. The Circuit instead found the process before it was valid because it included physical process steps under the now defunct *Freeman-Walter-Abele* test. *See Arrhythmia*, 958 F.2d at 1059; *see also supra* note 3. Similarly, the Federal Circuit relied on the "useful, concrete, and tangible result" test in *AT & T* to find a process claim valid per § 101. *See AT & T Corp.*, 172 F.3d at 1358. The *Freeman-Walter-Abele* test and the "physical steps" tests were predecessors of sorts to, and superceded by, the "useful, concrete, and tangible result" test. This test has also since been rejected explicitly by the Federal Circuit and the Supreme Court. *See Bilski I*, 545 F.3d at 959-60; *id.* at 960 n. 19; *In re Ferguson*, 558 F.3d 1359, 1364 (Fed.Cir.2009) (reaffirming that the "useful, concrete, and tangible" result test has no continuing validity); *Bilski II*, 130 S.Ct. at 3231.

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[10] Alice posits that the "electronic adjustment step, along with the maintenance of electronic accounts, and the generation of electronic instructions, are carried out because the computer implementing the claimed method acts as an electronic third party between two counterparties in an effort to minimize the risk that one counterparty will default." Alice Mem. 36 (citing Ginsberg Decl. ¶¶ 40-45). The claims recite a "supervisory institution" as the intermediary facilitating the exchange of obligations. *See* '479 Patent, claims 33-34; '510 Patent, claims 1-75. Alice suggests at one point that the intermediary may be a person or a company, *see* Alice Mem. 4-5 (contending that the patents disclose and claim in various ways a computerized trading platform for exchanging obligations in which "a trusted third party, running a computer system programmed in a specific way," settles the obligations and that the "the trusted third party—a 'supervisory institution'—operates a data processing system"), but even if the "supervisory institution" is a company or a computer, meaning a computer controls the entire method rather than a person implementing the steps of the method by way of computer, the claims before the Court at most implicitly recite a general purpose computer.

To be sure, the specification of the '479 Patent, which the '510 Patent largely shares, reveals a seemingly intricate "trading platform" invention consisting of systems and methods, with apparent software applications to be used in implementing the invention. The '479 Patent specification speaks to methods being conducted by way of specifically programmed computing devices. *See, e.g.*, '479 Patent, col. 28:12-16 ("The invention has industrial application in the use of electrical computing devices and data communications. The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices."); '510 Patent, col. 31:66-67 & col. 32:1-3 (same). The specification undoubtedly provides context for reading a patent's claims, but the plain language of the claims themselves is the measure of the breadth of patent protection granted. *See Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1116 (Fed.Cir.2004).

Alice points to unasserted claims 12 and 28 of the '479 Patent to demonstrate that if claims 33 and 34 are interpreted in context of other '479 Patent claims, it becomes clear that claims 33 and 34 also require computer implementation. *See* Ginsberg ¶¶ 30-31. The Court has accepted this proposition, however this juxtaposition reinforces the Court's conclusion that claims 33 and 34 of the '479 Patent are independent of the broader computer system revealed in the specification, and it demonstrates that the drafters of the claims of the '479 Patent knew how to explicitly recite to computer components.[11] Claim 12 discloses a detailed system which incorporates other claims, including the computer based processing system revealed in claim 1, and additionally claims an exchange institution holding a debit and credit record, that the "data processing apparatus" be "configured" to maintain a shadow credit and debit record for each stakeholder, and the "data processing means being configured" to obtain a start-of-day balance for the shadow credit and debit records and to at the end-of-day instruct the exchange institutions to adjust their records according to the transactions performed. *See* '479 Patent, col. 61:53-67 & col. 62:1-7. Claim 28 of the '479 Patent, on the other hand, is directed to a method of exchanging obligations similar to claims 33 and 34, but recites additional elements, such as a "data processing apparatus"—incorporated from claim 18—and that an independent shadow credit and debit record be maintained and that "at the end-of-day, the data processing apparatus instructing ones of the exchange institutions" to effectuate the exchanges accordingly. *Id.* col. 64:13-40.

Therefore, even assuming a reasonable construction favorable to Alice that claims 33 and 34 of the '479 Patent and each claim of the '510 Patent recites to computer implementation, the asserted claims contain no indication that the computers, or other devices required to implement the methods, are specifically programmed. The claims make no mention of any specific hardware, let alone software or specifically programmed hardware. Alice's expert construes the claims to require "a computer configured and programmed to carry out the processes of the claims." Ginsberg Decl. ¶ 15. Alice argues the term "shadow record" refers to electronic records maintained in a data storage unit by a computer programmed with application software. Alice Reply 24. While the specification and other claims of the '479 Patent may reveal specifically programmed computers, only claims 33 and 34 of the '479 Patent and the claims of the '510 Patent are before the Court, and according to the plain language of the terms actually employed in these claims it cannot be said that they reasonably recite to a specifically programmed computer.

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[11] "Other claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of a claim term. Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. Differences among claims can also be a useful guide in understanding the meaning of particular claim terms." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed.Cir.2005).

Furthermore, that the processes before the Court are conducted electronically, by way of a computer, fails to impose a meaningful limitation on the processes themselves. *See Every Penny Counts*, 2009 WL 6853402 at *2-3, 2009 U.S. Dist. LEXIS 53626 at *7 (finding the computerized method required machines for data input and output, and to perform calculations, but the machines imposed no limit on the process itself). A computer may facilitate and expedite the claimed methods, however the methods before the Court could be performed without use of a computer. Alice's expert acknowledges that the methods could be performed in a non-electronic format. "In an abstract sense, it is possible to perform the business methods of maintaining accounts, and providing an instruction without a computer or other hardware." Ginsberg Decl. ¶ 40. "If someone had thought of this invention 100 years ago, they might have implemented it in a non-electronic manner using various pre-computing tools such as an abacus or handwritten ledgers." *Id.*

Looking at the methods claimed by Alice, the Court need not even engage in abstraction to contemplate how they could be implemented without the use of electronics. The method of exchanging obligations by employing an intermediary to consummate the exchange after ensuring the parties have adequate value to guarantee the exchange, perhaps by keeping an up-to-date record of the parties' abilities to honor their obligations, and then providing an irrevocable instruction to the parties—or their representative banks or other value holders—to adjust their accounts or records accordingly, does not require the use of computers. *See Ultramercial, LLC v. Hulu, LLC*, No. 09-06918, 2010 WL 3360098, *5, 2010 U.S. Dist. LEXIS 93453, *13 (C.D.Cal. Aug. 13, 2010) (finding a computerized method invalid, in part, because "[t]here is nothing inherently computer-specific about receiving media from a content provider, choosing a sponsor for the media, selecting an ad for the sponsor, verifying the viewer's activity, assigning passwords, charging the sponsor for the advertisement, or any of the remaining steps"); *see also Benson*, 409 U.S. at 67, 93 S.Ct. 253 ("The mathematical procedures can be carried out in existing computers long in use, no new machinery being necessary. And, as noted, they can also be performed without a computer."); *Flook*, 437 U.S. at 586, 98 S.Ct. 2522 ("Although the computations can be made by pencil and paper calculations, the abstract of disclosure makes it clear that the formula is primarily useful for computerized calculations producing automatic adjustments in alarm settings."). Claims 33 and 34 of the '479 Patent and the claims of the '510 Patent are not meaningfully limited by a computer since a computer is not essential to the operation of the methods. *See SiRF Tech.*, 601 F.3d at 1333.

Even if computer implementation is not inherently necessary for the methods claimed, a computerized approach would indubitably expedite the exchanges. However, it is also true that simply because method claims call for computerized implementation to be usefully or pragmatically applied "does not mean, however, that the patent claims are limited to use on a computer, or, more importantly, that they are *tied* to one." *Ultramercial*, 2010 WL 3360098 at *5, 2010 U.S. Dist. LEXIS 93453 at *13 (emphasis in original). "That the disclosed invention is only used on computers or computer networks cannot alone satisfy the machine test without rendering the test completely toothless." *Id.* It is a truism that the "the particular methods claimed in these patents only work, as intended, when carried out using a computer," Ginsberg ¶ 41, but that alone does not mean that a computer meaningfully limits the processes. For the foregoing reasons, the Court finds that claims 33 and 34 of the '479 Patent and claims 1-75 of the '510 Patent fail to satisfy the machine-or-implementation test.[12] However, even if these claims were to satisfy the MOT test, the Court would still move next to analyze the claims under the abstract idea exception.

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[12] The Court notes that there will likely soon be further guidance from the Federal Circuit on the extent of interconnectedness required between a machine and a process for the process to satisfy the MOT test as several cases this Court finds persuasive—*Every Penny*, *DealerTrack*, *Fuzzysharp*, and *Ultramercial*—are all currently before the Circuit. The outstanding motions, however, have been pending too long to await further guidance.

3. Abstract Idea Exception to Patentability

CLS asserts that Alice's methods, claims 33 and 34 of the '479 Patent and claims 1-75 of the '510 Patent, attempt to patent the abstract idea of "'exchanging an obligation between parties' after ensuring that there is 'adequate value' in independent accounts maintained for the parties." CLS Mem. 24. CLS analogizes the method claims to a "two-sided 'escrow' arrangement for financial transactions" and likens Alice's supposed escrow-type invention to the hedging claims that were invalidated by the Supreme Court in *Bilski II*. *Id.* at 25. Alice defends the methods as "more than a mere statement of a concept," and insists they constitute "a particular solution to a real world problem in need of solving—eliminating counterparty risk with a complicated computer system programmed to perform the settlement." Alice Mem. 34. Alice argues against abstractness in that the "performance of the method can be observed and verified; settlements are completed electronically, with accounts being electronically debited and credited." *Id.* (citing Ginsberg Decl. ¶¶ 44-45).

The claims before the Supreme Court in *Bilski II*, which the Court found to encapsulate the concept of hedging, were directed to the steps of initiating a series of transactions between a commodity provider and consumers at a fixed rate which corresponded to consumers' risk positions, identifying market participants for the commodity who had a counter-risk position, and then initiating a series of transactions at a fixed price between the commodity provider and those market participants having a counter-risk position. *See Bilski II*, 130 S.Ct. at 3223-24. The Supreme Court found the invention claimed a fundamental economic practice. *Id.* at 3231. Similarly, a district court found a business method directed to allowing Internet users to view copyrighted material free of charge in exchange for viewing certain advertisements to be an unpatentable abstract idea. *See Ultramercial*, 2010 WL 3360098 at *6, 2010 U.S. Dist. LEXIS 93453 at *17. The district court found the method abstract because at its core sat "the basic idea that one can use advertisement as an exchange or currency." *Id*.

CLS argues that Alice's method claims are directed to unpatentable processes for exchanging an obligation based on a mathematical algorithm, as well as the abstract idea of transformation or manipulation of legal obligations or business risks. CLS Reply 23. The Court need not consider whether the methods, at heart, claim nothing more than an algorithm because the Court agrees that the methods are directed to an abstract idea of employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk. This is a basic business or financial concept much like those struck down in *Bilski II* or *Ultramercial*. At the heart of these claims is the fundamental idea of employing a neutral intermediary to ensure that parties to an exchange can honor a proposed transaction, to consummate the exchange simultaneously to minimize the risk that one party does not gain the fruits of the exchange, and then irrevocably to direct the parties, or their value holders, to adjust their accounts or records to reflect the concluded transaction. Using an intermediary, which may independently maintain records or accounts on the parties to ensure each party has sufficient value or worth to complete a proposed exchange, as a way to guarantee that a transaction is ultimately honored by all parties, thereby minimizing risk, remains a fundamental, abstract concept.

To demonstrate, independent claim 27 of the '510 Patent requires the supervisory institution to maintain an account for a first party which is independent of an account held by an exchange institution, to facilitate an exchange of obligations if the first party's account value (however defined) does not drop below zero, and to conduct a transaction with the exchange institution that is irrevocable at the end of a period to reflect the exchange of obligations made. *See* '510 Patent, claim 27. Essentially, this claim is directed to the abstract and fundamental concept of using an intermediary to guarantee an exchange. Similar to the invention in ***Flook***, which was found merely to provide a formula for computing an alarm limit, *see* ***Diehr***, 450 U.S. at 192 n. 14, 101 S.Ct. 1048, the invention here simply provides the formula, or manner, in which to use an electronic intermediary to exchange obligations as a way to hedge against the risk of loss. Independent claim 33 of the '479 Patent and independent claims 1, 61, 65, and 68 of the '510 Patent, each is directed as a whole to this same abstract concept.

Alice argues that the claimed methods "require the use of a computer and data storage unit programmed to perform a particular financial transaction, implement a concept in a tangible way with tangible, real world results—money is exchanged in the absence of counterparty risk." Alice Mem. 34. There may be no dispute that the methods claimed engender a practical result, but this fact alone does not rescue the claims from the realm of abstraction. Some abstract ideas, such as fundamental business concepts, although not patentable standing alone will nonetheless produce useful results when basically applied. *Cf. Bilski I*, 545 F.3d at 965 ("[T]he claimed process here as a whole is directed to the mental and mathematical process of identifying transactions that would hedge risk. The fact that the claim requires the identified transactions actually to be made does no more to alter the character of the claim as a whole."); *see also Diehr*, 450 U.S. at 192 n. 14, 101 S.Ct. 1048 (noting that the claims in *Flook* "did more than present a mathematical formula" but presented steps to calculate an updated alarm limit and replace the outdated alarm limit for which there were a "broad range of potential uses" in the petrochemical and oil refinery industries); *Ultramercial*, 2010 WL 3360098 at *7, 2010 U.S. Dist. LEXIS 93453 at *19 (stating that despite the Supreme Court coming to different conclusions on subject matter eligibility in *Diehr* and *Bilski II*: "In both [cases], the claimed invention discloses a real-world application of a mathematical formula. In both, a well-known or basic principle is linked to its practical use."). It would seem logical that the concept and application of hedging in the energy markets before the Supreme Court in *Bilski II* would produce practical and real world results; however the Court did not focus on this point, but instead held the claims were "broad examples" of a concept and the patent would ultimately preempt the use of the concept itself. *Bilski II*, 130 S.Ct. at 3231. The fact that a claim produces practical results may inform the abstract analysis, but it is not dispositive of subject matter eligibility.[13]

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[13] Alice does not argue that the identification of tangible, real-world applications is sufficient to satisfy the subject matter eligibility question. Yet, it is important to note that the "useful, concrete, and tangible result" test has been clearly disavowed by both the Federal Circuit and the Supreme Court. *See supra* note 9. An administrative patent judge, writing before the test was invalidated, noted that: "The decisions by the Court of Appeals for the Federal Circuit in *State Street Bank & Trust Co. v. Signature Financial Group Inc.* [149 F.3d 1368 (1998)] and *AT & T Corp. v. Excel Communications, Inc.* [172 F.3d 1352 (1999)]

A district court should instead focus on the extent to which the application of an abstract idea is specific and/or limited to determine whether an invention is patent eligible. Recently, the Federal Circuit reversed a district court's finding that a method for "rendering a halftone image of a digital image by comparing, pixel by pixel, the digital image against a blue noise mask" was unpatentable as directed to an abstract algorithm. *See Research Corp.*, 627 F.3d at 868. The Circuit found the invention was not abstract, in part, because it presented "functional and palpable applications in the field of computer technology" and addressed "a need in the art for a method of and apparatus for the halftone rendering of gray scale images in which a digital data processor is utilized in a simple and precise manner to accomplish the halftone rendering." *Id.* at 868-69. "Indeed, this court notes that inventions with specific applications or improvements to technologies in the

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have made it easier for the public to obtain patents covering computer implemented business-related inventions. In those decisions, the Court of Appeals for the Federal Circuit held that computer implemented business method-related inventions are deemed 'statutory' subject matter (subject matter that can be patented) under 35 U.S.C. § 101 if they have a 'practical application,' i.e., produce a 'useful, concrete and tangible result'. . . . This holding has had a profound effect on the growth of new patents and patent applications covering computer implemented business method inventions. The number of new applications of these types filed in Class 705 (designated as business and management data processing class) increased from 1370 in Fiscal Year 1998 to 2600 in Fiscal Year 1999 and to 7800 in Fiscal Year 2000. The number of patents issued from these types of applications increased from a total of 447 prior to 1986 to a total of 2,850 as of the end of Fiscal Year 1999." Chung K. Pak, *Patenting E-Commerce Inventions: Perspective From an Administrative Patent Judge*, 85 J. Pat. & Trademark Off. Soc'y 447, 448-49 (2003) (internal citations omitted).

marketplace are not likely to be so abstract that they override the statutory language and framework of the Patent Act." *Id.* at 869.

An analysis of the preemptive power of a claim is inextricably linked with the question of whether the application of an abstract idea is specific or limited. "Pre-emption of all uses of a fundamental principle in all fields and pre-emption of all uses of the principle in only one field both indicate that the claim is not limited to a particular application of the principle." *Bilski I*, 545 F.3d at 957; *see also Accenture*, 691 F.Supp.2d at 595 ("While it is not permissible to preempt the use of an intangible principle, an application of the principle may be patentable; the scope of the exclusion of others to practice or utilize the fundamental principle imparted by the claims must be examined.").[14] The abstract idea claimed by Alice's methods in claims 33 and 34 of the '479 Patent and each claim of the '510 Patent effectively preempt the use of an electronic intermediary to guarantee exchanges across an incredible swath of the economic sector. The *CyberSource* court found the claims before it "broadly preempt the fundamental mental process of fraud detection using associations between credit card numbers." *CyberSource*, 620 F.Supp.2d at 1077. Taking note of the fact that credit card transactions over the Internet have "become a staple of modern business,"

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[14] *See also Bilski I*, 545 F.3d at 953 ("Patents, by definition, grant the power to exclude others from practicing that which the patent claims. *Diehr* can be understood to suggest that whether a claim is drawn only to a fundamental principle is essentially an inquiry into the scope of that exclusion; i.e., whether the effect of allowing the claim would be to allow the patentee to pre-empt substantially all uses of that fundamental principle. If so, the claim is not drawn to patent-eligible subject matter.").

the court found the methods would "preempt the use of fundamental mental processes across an extraordinarily large and important segment of the commercial system." *Id*. The same is true here.

The processes claimed by Alice employ a supervisory institution to serve as an intermediary to exchange obligations, which may monitor the credit/debit accounts/records at the parties' exchange institution, and when sufficient value is present, the supervisory institution conducts the exchange of obligations and instructs the parties, or their value holding exchange institutions, to adjust their accounts/records accordingly. The methods broadly claim the idea of exchanging "obligations" by way of an intermediary. Although each claim should be considered independently and as a whole, by looking to the dependent claims of '510 Patent one understands the reach of the methods claimed. The dependent claims recite potential "obligations" as those that arise from any transaction linked to a "share price," a "weather event," a "market event," or a "currency exchange transaction,"[15] and explain that the exchange of obligations may represent the transfer of or transaction in "shares in financial or physical assets," "a wager," "a commodity," or "money for goods, services, promises, credits or warrants."[16] If patentable, these claims could preempt the use of an electronic intermediary, using a shadow credit and/or debit records, as a manner in which to exchange an infinite array of tangible and intangible representations of value.

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[15] *See* '510 Patent, col. 64:22 (Claim 2); *id*. col. 64:25 (Claim 3); *id*. col. 64:27 (Claim 4); *id*. col. 64:61 (Claim 18) (respectively).

[16] *See* '510 Patent, col. 64:29-30 (Claim 5); *id*. col. 64:32 (Claim 6); *id*. col. 64:34 (Claim 7); *id*. col. 64:36-37 (Claim 8) (respectively).

The remaining dependent claims in the '510 Patent as a whole also speak to the type of entity that might be an "exchange institution"—i.e. a credit card company, a debit card company, a bank, or a guarantor,[17] or they set forth basic realities of exchanging financial obligations, such as the fact that various institutions might exist in different time zones or be domiciled in legally and/or geographically different countries. *See* '510 Patent, col. 64:62-63 (Claim 19); *id.* col. 65:56-57 (Claim 37). Rather than limit the invention reflected in the '510 Patent, the dependent claims illustrate how broadly the invention might sweep its monopoly across commerce. These dependent claims are, inter alia, broad examples of what tangible and intangible items might be exchanged and the financial and institutional value holders to be governed by the '510 Patent. The claims simply recite how an electronic intermediary can be used to effectuate an almost infinite array of exchanges in the modern financial world. Unlike the concrete and palpable blue noise mask and pixel-by-pixel comparison method which resulted in a higher quality halftone digital image all while using less processor power and memory space which was before the Federal Circuit in *Research Corp.*, *see* 627 F.3d at 865, Alice's method claims are hardly limited to "specific applications" of an fundamental concept. *Id.* at 869.

It is clear that "limiting an abstract idea to one field of use or adding token postsolution components" does not make an abstract idea patentable. *Bilski II*, 130 S.Ct. at 3231; *see also Diehr*, 450 U.S. at 191, 101 S.Ct. 1048 (holding that the limitation against patenting an abstract idea cannot be circumvented by "attempting to limit the use of the formula to a particular technological environment," or by adding "insignificant postsolution activity" to transform a principle into a process). Limiting the use of the unpatentable Pythagorean theorem by claiming it could be usefully applied to surveying techniques would not make the invention patentable, *see Bilski I*, 545 F.3d at 957 (citing to *Flook*, 437 U.S. at 590, 98 S.Ct. 2522), no more than limiting the concept of hedging to the energy and commodities markets. *See Bilski II*, 130 S.Ct. at 3231; *see also CyberSource*, 620 F.Supp.2d at 1077. The method claims before the Court are not limited to any particular industry, but are supposedly limited by the use of a computer. As financial transactions, and the maintenance of accounts and/or records on a party's value or wealth, are increasingly likely to be monopolized by electronic and computer implementation and storage, the fact these claims are implemented electronically fails to limit the methods. *See Benson*, 409 U.S. at 71-72, 93 S.Ct. 253 (explaining that the practical effect of granting patent protection would be patenting an abstract idea since the algorithm before that court "ha[d] no substantial practical application except in connection with a digital computer"); *see also Ultramercial*, 2010 WL 3360098 at *6, 2010 U.S. Dist. LEXIS 93453 at *18. The method claims before the Court are not limited by electronic implementation, and in looking at the method claims as a whole they would serve to patent the fundamental and abstract concept itself. *See Benson*, 409 U.S. at 71-2, 93 S.Ct. 253.

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[17] *See* '510 Patent, col. 64:47 (Claim 12); *id.* col. 64:49 (Claim 13); *id.* col. 64:51 (Claim 14); *id.* col. 64:55 (Claim 16) (respectively).

Similar to *Bilski II*, in which the Supreme Court invalidated the dependent claims which purported to limit hedging to be "broad examples of how hedging can be used in commodities and energy markets," *Bilski II*, 130 S.Ct. at 3231, the dependent claims of the

'510 Patent and claim 34 of the '479 Patent, each when considered as a whole, constitute broad examples of potential parties, institutions, obligations, and circumstances under which the exchange of obligations—each dependent claim is no more than an attempt to limit the abstract concept to a field of use or to limit the invention by adding token postsolution components.

Also, that the methods entail an irrevocable instruction, assumed to be electronic in nature, to require that exchange institutions adjust their accounts or records according to the exchange conducted by the supervisory institution is subsumed within the abstract idea itself, if not insignificant postsolution activity. *See Flook*, 437 U.S. at 590, 98 S.Ct. 2522 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."); *Bilski I*, 545 F.3d at 966 (noting that abstract hedging claims required "performing the post-solution step of consummating those transactions"). In claiming the abstract idea of using an intermediary to guarantee the exchange of obligations to minimize risk, the final action that the parties, or their account holders, be met with an irrevocable instruction to adjust their account or record to reflect the consummated transaction is no more an inherent and necessary step in the abstract idea, if not an obvious post-solution step.

The Court finds claims 33 and 34 of the '479 Patent and claims 1-75 of the '510 Patent invalid are not directed to patentable subject matter.[18] The Court gives Alice the broadest reasonable construction of claim terms for purposes of its conclusion, for a court can bypass construction if construing the claims is not a material issue in resolving the motion. *See National Presto Indus.*, 76 F.3d at 1189. We now move to the remaining system and product claims at issue.

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[18] While the Court presumes that claims 33 and 34 of the '479 Patent are implemented electronically, a finding that the claims require no computer implementation at all, a point CLS argues,

B. Computer System & Product Claims

The claims of the '720 and '375 Patents represent system and product claims. CLS contends that Alice simply recasts its abstract method claims in a physical embodiment in an attempt to employ the draftsman's art to save these claims from falling within the fundamental principles exceptions. Alice counters that these claims clearly fall within the category of inventions protected by the Patent Act and that there is no controlling precedent of courts finding a machine, a physical object made of parts, to be unpatentable as abstract.

1. Statutory Category

The claims of the '720 and '375 Patents are directed to either a machine or a manufacture under § 101. A "machine" is a "a concrete thing, consisting of parts, or of certain devices and combination of devices." *Nuijten*, 500 F.3d at 1355 (quoting *Burr*, 68 U.S. at 570). A machine "includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." *Id.* (quoting *Corning v. Burden*, 56 U.S. 252, 267, 15 How. 252, 14 L.Ed. 683 (1854)). A manufacture, on the other hand, is one or more articles prepared "for use from raw or prepared materials by

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would only bolster the Court's finding that the claims are abstract.

giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery." *Id.* at 1356 (quoting *Chakrabarty*, 447 U.S. at 308, 100 S.Ct. 2204). Machine and method claims differ: "A machine is a thing. A process [or method] is an act, or a mode of acting. The one is visible to the eye—an object of perpetual observation. The other is a conception of the mind, seen only by its effects when being executed or performed." *Expanded Metal Co. v. Bradford*, 214 U.S. 366, 384, 29 S.Ct. 652, 53 L.Ed. 1034 (1909) (citation omitted).

Each of the 84 claims in the '720 Patent is directed to a particular "data processing system" to enable an exchange of obligations. Every claim in the '720 Patent recites "a data storage unit having stored therein" information about shadow accounts and/or records, and a "computer, coupled to said data storage unit," that is "configured" to perform steps of exchanging obligations similar to those laid out in the asserted method claims.[19] As an example, independent claim 1 of the '720 Patent claims a data storage unit with stored information about a shadow credit and debit record that is independent of accounts held by an exchange institution, and which is coupled with a computer configured to receive a transaction, electronically adjust the shadow credit and/or debit record to effect the exchange of an obligation if the value of the shadow debit record does not fall below the value of the shadow credit record, and generate an irrevocable instruction to an exchange institution to adjust its record(s) accordingly. *See* '720 Patent, col. 65:42-61. Essentially, the independent claims of the '720 Patent claim a computer that is configured to perform methods of exchanging an obligation, such as claims 1, 28, 60, and 68, or they claim methods of facilitating a purchase between parties, such as claims 64 and 80.

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[19] *See* '720 Patent, col. 65:42-61 (Claim 1); *id.* col. 67:1-18 (Claim 28); *id.* col. 68:33-53 (Claim 60); *id.* col. 68:62-66 & col. 69:1-11 (Claim 64); *id.* col. 69:20-42 (Claim 68); *id.* col. 70:20-37 (Claim 80) (collectively, the six independent claims of the '720 Patent).

Similarly claims 1-38 and 42-47 of the '375 Patent are directed to a particular "data processing system" which enables the exchange of obligations. As with the claims in the '720 Patent, claims 1-38 and 42-47 of the '375 Patent each requires "a data storage unit having stored therein" information about accounts or records, and a "computer, coupled to said data storage unit," that is "configured" to perform certain steps of effecting an exchange obligation.[20] In contrast to the '720 Patent claims, the '375 Patent systems additionally claim a computer configured to "receive a transaction" from a "first party device," a "second party device," and/or a "communications controller." *See, e.g.*, '375 Patent, col. 65:4 (Claim 1); *id.* col. 65:62 (Claim 12); *id.* col. 66:3 (Claim 14). The first or second party devices represent, as an example, "communications hardware products used by the stakeholders to communicate data or instructions to or from the processing units and are also referred to as stakeholder input/output devices." Ginsberg Decl. ¶ 53. "These may be personal computers [or] mini- or mainframe computers fitted with modems." *Id.* Separately, the "communications controller" effects communications between the devices and the computer system by performing communications coordination and/or by adding security processing for the instructions. *Id.* ¶ 54; *see also* '375

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[20] *See* '375 Patent, col. 65:1-30 (Claim 1); *id.* col. 66:1-29 (Claim 14); *id.* col. 66:61-65 & col. 67:1-26 (Claim 26) (collectively, the three independent system claims of the '375 Patent).

Patent, col. 7:46-54. Therefore, claims 1-38 and 42-47 of the '375 Patent add to the computer system claimed by the '720 Patent a mechanism by which parties independently may input the transaction(s) they wish the computer system to effectuate.

Independent claim 39 and dependent claims 40 and 41 of the '375 Patent are directed to a "computer program product" containing a particular program code. *See* '375 Patent, col. 68:5 (Claim 39); *id.* col. 68:36 (Claim 40); *id.* col. 68:38 (Claim 41). Each of these claims recites a "computer readable storage medium" having "computer readable program code embodied in the medium." *Id.* col. 65:5-7 (Claim 39). The parties appear to agree for the present that these claims represent a computer readable medium containing software that instructs a computer how to submit a transaction and allow a party to view information on the processing of the exchange of obligations by the supervisory institution, which mimics the methods claimed in the '510 Patent. *See* CLS Mem. 35; Alice Mem. 25.

The Court first determines whether these claims fall within the statutory class of inventions covered by § 101. At first glance, a computer is a concrete item made of parts that would appear to fit clearly within the statutory protection afforded by § 101 as a machine, *see Nuijten*, 500 F.3d at 1355, so that every claim of the '720 Patent and claims 1-38 and 42-47 of the '375 Patent appear to fit within the § 101 categories.[21] Claims 39-41 of the '375 Patent are directed to a computer program product. The body of claim 39, from which claims 40 and 41 depend, recites "program code," which alone could be statutorily invalid as "an idea without physical embodiment," *see Microsoft Corp. v. AT & T Corp.*, 550 U.S. 437, 449, 127 S.Ct. 1746, 167 L.Ed.2d 737 (2007); however the preamble to claim 39 recites a computer readable storage medium containing a computer readable program. *See* '375 Patent, col. 65:5-7. A computer readable medium, such as a disk or hard drive, containing program code could be considered either a manufacture or a machine under § 101.[22] *See Nuijten*, 500 F.3d at 1355-56; *cf. In re Beauregard*, 53 F.3d 1583 (Fed.Cir.1995).

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[21] However, there is the possibility that if the '720 and '375 Patents system claims are only directed to a general purpose computer lacking specific programming, the general purpose computer claimed would not be considered a machine under § 101. *See* 35 U.S.C. § 101; *Alappat*, 33 F.3d at 1545 (holding a

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claim which read on a general purpose computer was a machine under § 101 because a "general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software" thereby creating a "new machine" to qualify as a statutorily patentable invention under § 101). Although no specific software or program code is explicitly recited in the claims of the '720 Patent or claims 1-38 or 42-47 of the '375 Patent, the claims do state that a computer is "configured" to perform the functions. Therefore, assuming a broad construction of the claims, the Court assumes for purposes of these motions that the computer systems claimed have been specifically programmed and statutorily qualify as an machine under § 101.

[22] The Board of Patent Appeals and Interferences recently found that a computer program recorded on a computer-readable medium qualified statutorily for patent protection. "Computer programs and data structures are deemed 'functional descriptive material,' which impart functionality when employed as a computer component. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized." *Ex Parte Comer*, No. 2009-006782, 2010 WL 3626532, *4 (B.P.A.I. Sept. 16, 2010).

2. Abstract Idea Exception to Patentability

Assuming the claims of the '720 and '375 Patents are directed to machines or manufactures under § 101, the Court must still analyze these inventions under the exceptions for fundamental principles which apply to all four categories of § 101 patent eligible inventions. *See AT & T Corp. v. Excel Commc'ns*, 172 F.3d 1352, 1357-58 (Fed.Cir.1999); *see also Benson*, 409 U.S. at 67-8, 93 S.Ct. 253; *In re Ferguson*, 558 F.3d 1359, 1363 (Fed.Cir.2009).[23] The "specific question whether a machine represents nothing more than a law of nature, natural phenomenon, or abstract idea is unquestionably the correct one in light of *Bilski*." *Chamberlain Group, Inc. v. Lear Corp*., No. 5-3449, 756 F.Supp.2d 938, 968, n. 13, 2010 WL 4884448, at *26 n. 13, 2010 U.S. Dist. LEXIS 124566, *80 n. 13 (N.D.Ill. Nov. 24, 2010) (citing *Bilski II*, 130 S.Ct. at 3225); *see also id*. at 967, at *24, 2010 U.S. Dist. LEXIS 124566 at *74-75.[24]

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[23] For instance, in *Alappat* the Federal Circuit also analyzed the machine claim before it under the fundamental principles exception to ensure that the claim did not simply recite a mathematical algorithm or an abstract idea. *See Alappat*, 33 F.3d at 1544. The Federal Circuit found the machine claim, as a whole, was not directed to an algorithm or abstract idea, in part by employing the "useful, concrete, and tangible result" test. *See id*. That the claim qualified as a machine statutorily, *see supra* note 21, was not determinative in the Circuit's analysis, however, of whether the claim was abstract. The Court reads the case to instruct that while programming a general purpose computer may be how a "machine" is adjusted to fit within the patent eligible categories of § 101, such programming does not immunize the claim from failing under the abstract idea analysis.

[24] "Labels are not determinative in § 101 inquiries. *Benson* applies equally whether an invention is claimed as an apparatus or process, because the form of the claim is often an exercise in

Alice holds up *State Street* to support its argument that its process and/or software claims are directed to patent eligible subject matter. In *State Street*, the Federal Circuit reviewed machine claims under the abstract analysis and ultimately found the claims were patentable because they satisfied the "useful, concrete, and tangible result." *See State Street*, 149 F.3d at 1373. The Federal Circuit concluded, "[t]he question of whether a claim encompasses statutory subject matter should not focus on which of the four categories of subject matter a claim is directed to-process, machine, manufacture, or composition of matter—but rather on the essential characteristics of the subject matter, in particular, its practical utility." *Id.* at 1375. In analyzing the *State Street* claims, the Circuit did not note any potential preemptive effects of the claims, but focused only on the results produced by the claims. However, the "useful, concrete, and tangible result" test has been thoroughly rejected, *see Bilski II*, 130 S.Ct. at 3221, at least partly because its application proved too liberal in filtering out abstract claims. *See id.* at 3232 n. 1 (Stevens, J. concurrence); *id.* at 3259 (Breyer, J. concurrence) (noting the "useful, concrete, and tangible result" test would, if taken

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drafting. Moreover, that the claimed computing system maybe a 'machine' within 'the ordinary sense of the word,' . . . is irrelevant." *State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 927 F.Supp. 502, 511 (D.Mass.1996), *rev'd on other grounds*, 149 F.3d 1368. The Federal Circuit in *State Street* faulted the district court's conclusion in its abstract analysis, not that the district court actually applied the abstract analysis to the respondent's method and machine claims. The Circuit noted that "although we do not make this determination here, the judicially created exceptions, i.e., abstract ideas, laws of nature, etc., should be applicable to all categories of statutory subject matter, as our own precedent suggests." *State Street*, 149 F.3d at 1372 n. 1 (citations omitted).

literally, allow claims to be patentable where the Supreme Court has held to the contrary (citing cases, including *Flook*) and that the test "preceded the granting of patents that ranged from the somewhat ridiculous to the truly absurd") (internal citations and quotation marks omitted).

In the instant matter, the Court follows the reasoning of the Supreme Court in *Bilski II*, which concentrated not on the usefulness or practicality of claims, but on whether claims are directed to a fundamental concept as demonstrated, as least in part, by their preemptive force. *See id.* at 3231. Just as the claims in *Bilski II* were not saved from the abstract exception because they may have nominally claimed a "process" under § 101, nor can Alice's system or product claims be saved only by the fact they may nominally recite a "computer" or "manufacture."

CLS argues that the language of Alice's system and method claims are essentially one and the same, merely replacing the term "supervisory institution" from the '510 Patent with an unspecified "computer" in every claim of the '720 Patent and claims 1-38 and 42-47 of the '375 Patent. *See* CLS Mem. 34. Accordingly, CLS argues the system claims in the '720 and '375 Patents represent nothing more than an attempt to recast an abstract method as tangible hardware to circumvent the limitations on subject matter eligibility. *See id.* at 34. Alice acknowledges the similarity, but disputes that the various claims are identical. *See* Ginsberg Decl. ¶ 52. The similarities are immediately apparent, even if not entirely identical. As an example, system claim 68 of the '720 Patent mimics the language of method claim 68 of the '510 Patent language in that the method steps are almost identical but the "supervisory institution" recited in method claim 68 of the '510 Patent is replaced by a "data processing system," or a computer, in the system claim. Compare '720 Patent, col. 69:20-42, with '510 Patent, col. 67:38-41 & col. 68:1-19; *see also* CLS Mem. 13.

The Court has found Alice's asserted method claims to be directed to an abstract concept. The system claims of the '720 Patent represent merely the incarnation of this abstract idea on a computer, without any further exposition or meaningful limitation. Although it is unsettled as to when a claim to a machine or manufacture is abstract,[25] the Court concludes that the system claims in the '720 Patent would preempt the use of the abstract concept of employing a neutral intermediary to facilitate simultaneous exchange of obligations in order to minimize risk on any computer, which is, as a practical matter, how these processes are likely to be applied. *Cf. Alappat*, 33 F.3d at 1544 ("Indeed, [machine] claim 15 as written is not 'so abstract and sweeping' that it would 'wholly pre-empt' the use of any apparatus employing the combination of mathematical calculations recited therein.") (quoting *Benson*, 409 U.S. at 68-72, 93 S.Ct. 253). Unlike the machine claim in *Alappat*, the '720 Patent claims, as written, would wholly preempt the use of the abstract concept in any computer. Despite the fact that the '720 Patent system claims and Alice's asserted method claims are directed to different patent eligible categories under § 101, their preemptive effect would be largely one and the same. As the Court finds the '720 Patent claims are directed to the same abstract concept as the method claims, the reasoning underlying the abstract determination on the method claims applies with equal force to the claims of the '720 Patent. *See supra* Part III(A)(3).

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[25] *See, e.g.*, *Ferguson*, 558 F.3d at 1367 (Newman, J., concurring) ("There are indeed many uncertainties remaining in this court's restructure of the legal framework of modern technology and its fruits. However, the potentially complex issues of when computers are *Bilski*-acceptable machines do not arise in the Ferguson claims. I agree that these issues require clarification, for uncertainty as to legal rights is as much a disincentive to commerce as is their deprivation. However, this case is not the appropriate vehicle for dictum of potentially large consequence.") (referring to *Bilski I*, 545 F.3d 943).

The impact of the '720 Patent on common and everyday financial transactions speaks to its preemptive effect. Independent claims 1, 27, 60, and 68 of the '720 Patent mirror the fundamental concepts claimed by the '510 Patent. System claim 64, on the other hand, essentially enables a purchase between a buyer and seller, in which the system recited maintains a shadow account for a buyer and seller independent of those held by a bank, and the computer is configured to receive a transaction, adjust the accounts of the buyer and seller to effectuate the purchase if the accounts have sufficient value, and to generate an irrevocable instruction to the bank(s) to adjust their account(s) accordingly. *See* '720 Patent, col. 68:62-66 & col. 69:1-11. Such a "system" is simply an electronic intermediary that maintains its own shadow accounts to guarantee and effect purchases between parties. Claim 67, which depends from claim 64, further entails means "for allowing said buyer to acquire an item from said seller, wherein the purchase relates to said item." *Id.* col. 69:17-19. Independent claim 80 of the '720 Patent is directed to the same basic concept of enabling a purchase by an electronic intermediary as claim 64, except it defines the stakeholders as a "first party" and a "second party" and refers to first or second accounts. *Id.* col. 70:20-37.

Chamberlain, a district court decision following *Bilski II*, well illustrates the issue here. The *Chamberlain* invention claimed a physical transmitter that sent out an encrypted signal to control an actuator (as part of a garage door opening system), which the court held was a machine under § 101. *See Chamberlain*, 756 F.Supp.2d at 965-68, 2010 WL 4884448 at *23-25, 2010 U.S. Dist. LEXIS 124566 at *73, 78-79. In analyzing the exception for fundamental principles, the court found the claims before it were not an attempt to patent a mere algorithm and that no preemption concerns were raised. *Id.* at 968-69, at *26, 2010 U.S. Dist. LEXIS 124566 at *84. When viewed in the context of the entire claim, the algorithm was directed at a "physical product that is to be used for a specific purpose" and would not "preclude the use of the mathematical algorithms that operate within the transmitter for other purposes." *Id.* at 969, at *26, 2010 U.S. Dist. LEXIS 124566 at *84-85. The court also noted that the physical transmitter was not simply insignificant extra-solution activity since "the machine, to the contrary, constitutes the very heart of the invention." *Id.* at 969, at *26, 2010 U.S. Dist. LEXIS 124566 at *85.

The machine claims before the *Chamberlain* court stand in stark contrast to the '720 Patent claims before this Court. Here, preemption concerns of a basic concept across an unlimited field are preeminent. The system claims are not a specific and limited application of a general business concept, but instead seek to preempt the concept itself when employed by any computer coupled with a data storage unit. The system claims are no more limited than the method claims simply because they are directed to a data processing system. The effect of allowing these claims to be patentable would be to allow Alice "to pre-empt substantially all uses of th[e] fundamental principle." *Bilski I*, 545 F.3d at 953.

Further, the dependent claims of the '720 Patent only serve to limit the invention to a field of use and are no more than token postsolution components. *See Bilski II*, 130 S.Ct. at 3231. The dependent claims merely demonstrate the all-encompassing nature of the steps, or methods, that the '720 Patent system claims are intended to implement. As with the dependent claims of the '510 Patent, the dependent claims of the '720 Patent describe a plethora of possible transactions or accounts that would be covered by the system,[26] what the "exchange institution" might be,[27] or circumstances under which the exchanges might be effectuated.[28]

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[26] *See, e.g.*, '720 Patent, col. 65:64-65 ("transaction linked to a share price") (Claim 2); *id.* col. 65:28 ("weather event") (Claim 3); *id.* col. 66:3 ("market event") (Claim 4); *id.* col. 66:5-6 ("transfer of shares in financial or physical assets") (Claim 5); *id.* col. 66:10 ("transfer of a commodity") (Claim 7); *id.* col. 66:13 ("money for goods, services, promises, credits or warrants") (Claim 8); *id.* col. 66:64-67 ("claim 1, further comprising means for allowing said party to acquire an item from another party, wherein the exchange obligation relates to said item") (Claim 27); *id.* col. 70:1-2 ("exchange obligation involves currency") (Claim 74).

[27] *See, e.g.*, '720 Patent, col. 66:22 ("a credit card company") (Claim 12); *id.* col. 66:24 ("a debit card company") (Claim 13); *id.* col. 66:26 ("bank") (Claim 14); *id.* col. 69:44 ("central bank") (Claim 69); *id.* col. 70:3-5 ("non-bank clearing house or depository") (Claim 75).

[28] *See, e.g.*, '720 Patent, col. 66:38-40 (where exchange institutions operate in different times zones) (Claim 19); *id.* col. 66:41-43 (where exchange institutions have different processing cycles) (Claim 20); *id.* col. 66:47-50 (where "said data storage unit has stored therein a balance for said shadow credit record and/or shadow record obtained from said exchange institution") (Claim

While not dispositive for this analysis, it is worthwhile to note that the dependent claims of the '720 Patent recite details to flesh out the steps, parties, and circumstances under which obligations are to be exchanged—mirroring the '510 Patent dependent claims—but do not further describe or limit the claimed data processing system as a machine. Unlike the machine claims in *Chamberlain*, the steps of exchanging an obligation (and not the computer system claimed) are the true "heart" of Alice's invention. *Cf. Chamberlain*, 756 F.Supp.2d at 968-70, 2010 WL 4884448 at *26-27, 2010 U.S. Dist. LEXIS 124566 at *85.[29] The Court looks to what, at base, is claimed by the '720 Patent claims—and that is an abstract concept. The Court agrees with CLS that, in these circumstances, "a computer system merely 'configured' to implement an abstract method is no more patentable than an abstract method that is simply 'electronically' implemented." CLS Reply 31; *see also Kuno*, 2010 WL 5127425 at *10 (finding machine and manufacture claims abstract and noting that "[i]n essence, these claims merely recite a general purpose computing device intended to facilitate the future execution of the recited [algorithms] similar to those in the independent method claims that we found to be ineligible under § 101").[30]

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22); *id*. col. 70:41-42 (instruction is generated at the end of the day) (Claim 82).

[29] *See also* Ginsberg Decl. ¶ 52 (speaking of the '720 and '375 Patents, noting that "at a general level, the basic settlement operations could be performed without the aid of a computer if they were not so claimed").

[30] To be clear, the Court does not hold that Alice's process claims in the '720 Patent fail to recite patent eligible subject matter because they mimic the asserted method claims in the

The Court also applies this analysis and result to system claims 1-38 and 42-47 of the '375 Patent. Although these claims recite an additional component of allowing stakeholders an ability to transmit requested transactions directly to the computer system via a "first party device," a "second party device," or a "communications controller,"[31] the claims simply indicate that the stakeholders can interact with the computer system, without intermediaries, and that the computer system itself will ultimately effect the exchange of obligations. That the parties can directly input desired transactions using modems, land line phones, a fax machine, or otherwise, *see* '375 Patent, col. 7:55-67 & col. 8:1-5, to reach a "communications controller" represents token "postsolution components" and fails to make the claims patentable. *See Bilski II*, 130 S.Ct. at 3231. The "fact that the claim requires the identified transactions actually to be made does no more to alter the character of the claim as a whole." *Bilski I*, 545 F.3d at 965.

The dependent claims at most attempt to limit the fundamental concept to a field of use, by defining the "obligations" that are to be exchanged, the conditions under which obligations are to be exchanged, and/or the respective parties and institutions to the transaction. At the heart of these claims is the same fundamental concept of employing a neutral intermediary to facilitate a simultaneous and irrevocable exchange of obligations in order to minimize risk. The system

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'479 and '510 Patents. The Court finds the '720 Patent process claims when considered as a whole to be unpatentable because, similar to the method claims they mimic, they are directed to an abstract concept.

[31] *See, e.g.*, '375 Patent, col. 65:4 (Claim 1); *id.* col. 65:62 (Claim 12); *id.* col. 66:3 (Claim 14) (respectively).

claims in the '375 Patent recite no more specific or limited application of the fundamental concept than the claims already addressed.

Lastly, the three program claims in the '375 Patent are also directed to the same abstract concept despite the fact they nominally recite a different category of invention under § 101 than the other claims asserted by Alice. Claim 39 recites "program code" to cause a computer to allow a party to send a transaction relating to "an exchange obligation arising from a currency exchange transaction between" a first and second party. '375 Patent, col. 68:10-12, 14. The program code also causes the computer to allow a party to view information relating to the "processing" of the obligation exchange by a supervisory institution. *Id.* col. 68:15. The processing that one can view by way of the program code constitutes the general steps of exchanging an obligation that arise in the other Patents, i.e., maintaining information about the parties' accounts, electronically adjusting the accounts to effect the exchange obligation, and generating an irrevocable instruction to the exchange institutions. *Id.* col. 68:17-35. CLS argues that claims 39-41 of the '375 Patent do no more than mirror method claim 68 of the '510 Patent, except that the computer program allows a party, by computer, to send a transaction and view information relating to the method claims. CLS Mem. 35. It is true that independent claim 39 recites as part of the claim a process almost identical to a method claimed in the '510 Patent. *Compare* '375 Patent, col. 68:17-35, *with* '510 Patent, col. 68:1-19.

To be sure, the application of an abstract idea does not render a claim unpatentable under § 101, *see Diehr*, 450 U.S. at 187, 101 S.Ct. 1048, however these claims seek to claim the fundamental concept itself, and not a limited or specific application of the concept. Claims 39-41 of the '375 Patent allow a party to use a computer to submit a preferred transaction—the first and necessarily inherent step in the fundamental concept of employing an intermediary to facilitate a simultaneous and irrevocable exchange of obligations to minimize risk—and then to observe the processing, or implementation, of the fundamental concept itself. The additional elements of programming to allow a party to submit a transaction and view the exchange does little to mitigate the preemptive effect of these claims on the fundamental concept. Moreover, dependent claim 40 does no more than attempt to limit the invention to a field of use by confining the submitted "transaction" to one that involves currency, *see* '375 Patent, col. 68:37, and claim 41 similarly attempts to limit the claim by only allowing a party to view preauthorized information relating to the processing. *Id.* col. 68:38-41. These two dependent claims represent no more than "broad examples" of how the fundamental concept can be applied and implemented. *See Bilski II*, 130 S.Ct. at 3231.

IV. CONCLUSION

For the foregoing reasons, the Court will grant CLS's motion for summary judgment. The Court finds claims 33 and 34 of the '479 Patent and each claim of the '510 Patent, '720 Patent, and '375 Patent to be directed to an abstract idea under the *Benson*, *Flook*, *Diehr*, and *Bilski* Supreme Court line of precedent. Accordingly, these claims are invalid as being directed to patent-ineligible subject matter under § 101 of the Patent Act. A memorializing Order accompanies this Memorandum Opinion.

APPENDIX D

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

No. 2011-1301

CLS BANK INTERNATIONAL,
Plaintiff-Appellee,

and

CLS SERVICES LTD.,
Counterclaim-Defendant Appellee,

v.

ALICE CORPORATION PTY. LTD.,
Defendant-Appellant.

Oct. 9, 2012

Appeal from the United States District Court
for the District of Columbia, No. 07-CV-0974,
Rosemary M. Collyer, Judge.

ORDER

Before RADER, Chief Judge, NEWMAN, LOURIE, BRYSON, LINN, DYK, PROST, MOORE, O'MALLEY, REYNA, and WALLACH, Circuit Judges.

PER CURIAM.

A petition for rehearing en banc was filed by Appellees CLS Bank International and CLS Services Ltd. (collectively "CLS Bank"), and a response thereto was invited by the court and filed by Appellant Alice Corporation Pty. Ltd. ("Alice").

The petition for rehearing was considered by the panel that heard the appeal, and thereafter the petition for rehearing en banc, the response, and the briefs of amici curiae were referred to the circuit judges who are authorized to request a poll of whether to rehear the appeal en banc. A poll was requested, taken, and the court has decided that the appeal warrants en banc consideration.

Upon consideration thereof,

IT IS ORDERED THAT:

(1) The petition of CLS Bank for rehearing en banc is granted.

(2) The court's opinion of July 9, 2012 is vacated, and the appeal is reinstated.

(3) The parties are requested to file new briefs addressing the following questions:

a. What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible "abstract idea"; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent-ineligible idea?

b. In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium; and should such claims at times be considered equivalent for § 101 purposes?

(4) This appeal will be heard en banc on the basis of the originally-filed briefs, additional briefing ordered herein, and oral argument. An original and thirty copies of all originally-filed briefs shall be filed within

20 days from the date of filing of this order. An original and thirty copies of new en banc briefs shall be filed, and two copies of each en banc brief shall be served on opposing counsel. CLS Bank's en banc brief is due 45 days from the date of this order. Alice's en banc response brief is due within 30 days of service of the CLS Bank new en banc brief, and the reply brief within 15 days of service of the response brief. Briefs shall adhere to the type-volume limitations set forth in Federal Rule of Appellate Procedure 32 and Federal Circuit Rule 32.

(5) The court invites the views of the United States Patent and Trademark Office as amicus curiae. Other briefs of amici curiae will be entertained, and any such amicus briefs may be filed without consent and leave of court but otherwise must comply with Federal Rule of Appellate Procedure 29 and Federal Circuit Rule 29.

(6) Oral argument will be held at a time and date to be announced later.

OPPOSITION
BRIEF

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Supreme Court, U.S.
FILED
NOV - 6 2013
OFFICE OF THE CLERK

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY., LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

**On Petition For A Writ Of Certiorari
To The United States Court Of Appeals
For The Federal Circuit**

BRIEF IN OPPOSITION

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QUESTION PRESENTED

Absent an inventive concept, a method of performing well-understood economic activity is not patent-eligible under 35 U.S.C. § 101. *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3231 (2010); *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012). The method, media, and system claims asserted here "simply recite how an electronic intermediary can be used to effectuate an almost infinite array of exchanges in the modern financial world" and, accordingly, would "effectively preempt the use of an electronic intermediary to guarantee exchanges across an incredible swath of the economic sector." Pet. App. 218a, 220a. The question presented is:

Whether the en banc Federal Circuit correctly affirmed the district court's judgment that all of the asserted claims are not patent-eligible under Section 101.

RULE 29.6 STATEMENT

Pursuant to this Court's Rule 29.6, undersigned counsel state that:

CLS UK Intermediate Holdings Ltd. is a publicly held corporation that owns 10% or more of the stock in CLS Bank International and CLS Services Ltd. In addition, CLS UK Intermediate Holdings Ltd. is owned (100%) by CLS Group Holdings AG.

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BRIEF IN OPPOSITION

Respondents CLS Bank International ("CLS Bank") and CLS Services Ltd. (collectively, "CLS") respectfully submit that the petition for a writ of certiorari should be denied because the judgments below are correct and because in any event the question presented would benefit from further percolation in the Federal Circuit, to which three new judges have been confirmed since the en banc decision in this case. If, however, the Court were to determine that the time is ripe to again review the patent-eligibility of computer-implemented claims under 35 U.S.C. § 101, then this case presents the best vehicle among the several recent decisions to have addressed variations on this theme.

STATEMENT

Petitioner Alice Corporation Pty. Ltd. owns four related patents that, as pertinent here, describe the economic activity of using an intermediary to mitigate settlement risk in financial transactions. The claims asserted against CLS recite computer-implemented methods of settling such transactions, as well as computer-readable media and generic computer systems capable of storing and running, respectively, programming instructions for performing the claimed method, although the patents do not disclose or claim the programming itself. The district court held that all of the asserted claims are patent-ineligible under 35 U.S.C. § 101 because they impermissibly attempt to monopolize the core economic idea of intermediated settlement, or escrow. Pet. App. 172a-238a. After a panel reversed in a 2-1 decision (*id.* at 132a-71a), the Federal Circuit granted rehearing en banc (*id.* at 239a-41a) and issued a per curiam affirmance of the district court's judgment (*id.* at 1a). In separate opinions, a 7-3 majority of the court agreed that Alice's method and media claims are ineligible. *See id.* at 3a n.1 (opinion of Lourie, J.). As to Alice's system claims, the district court's judgment was affirmed by an equally divided court. *Id.* at 2a.

1. Section 101 sets forth the categories of patentable inventions ("new and useful process, machine, manufacture, or composition of matter"), and "contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." *Ass'n for Molecular Pathology* v. *Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013) (punctuation omitted); *see also*, *e.g.*, *Gottschalk* v. *Benson*, 409 U.S. 63, 67 (1972); *Parker* v. *Flook*, 437 U.S. 584, 589 (1978); *Diamond* v. *Diehr*, 450 U.S. 175, 185 (1981).

For example, patent claims drawn to "the basic concept of hedging, or protecting against risk" cover an abstract idea, and thus are not eligible for patenting even if "described" in a series of steps or "reduced to a mathematical formula." *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3231 (2010). Section 101 does not allow a patent on "a fundamental economic practice," because it "would effectively grant a monopoly over an abstract idea." *Ibid.* Moreover, a patentee cannot render an otherwise ineligible claim patentable by narrowing it "to one field of use or adding token postsolution components" (*ibid.*) or limiting it to "a particular technological environment." *Id.* at 3230 (citation omitted). These "drafting effort[s]," like others, cannot transform an ineligible idea into an eligible patent claim. *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct.

1289, 1301-03 (2012). This Court consistently has declined to construe "patent statutes in ways that make patent eligibility depend simply on the draftsman's art without reference to the principles underlying the prohibition against patents for [abstract ideas]." *Id.* at 1294 (punctuation omitted).

This Court recently emphasized "that a process that focuses upon the use of" an abstract idea must "also contain other elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [abstract idea] itself." *Mayo*, 132 S. Ct. at 1294. Requiring patentees to recite claim elements that contain "significantly more" than the idea itself (or, synonymously, an "inventive concept") is grounded in "the basic underlying concern" that "patent law not inhibit further discovery by improperly tying up the future use of" abstract ideas. *Id.* at 1301-02. This "underlying functional concern," which informs all of this Court's Section 101 precedents, is "a *relative* one: how much future innovation is foreclosed relative to the contribution of the inventor." *Id.* at 1303. The inventive concept requirement ensures that a patent cannot foreclose innovation out of proportion with its contribution to the Progress of Science and useful Arts. *Ibid.* This concern is the province of Section 101 because other sections of the Patent Act "are not equipped to" serve the same goal. *Id.* at 1304.

Because patents should contribute to technological progress rather than merely foreclose it, it is not "*enough*" to add "well-understood, routine, conventional" elements to an abstract idea. *Mayo*, 132 S. Ct. at 1297-98. Such conventional elements, by definition, do not contribute to human knowledge; they might "narrow" the "principles" the claims "embody," but "the creative value of the discovery" of such a narrow idea "is also considerably smaller." *Id.* at 1303. Accordingly, the "bright-line prohibition against patenting" abstract ideas cannot be drafted around by adding routine elements, by limiting the claim to a particular technological environment, or by rephrasing it to cover the same scope by tricks such as breaking the claim into steps. *Ibid.* "[O]ne must do more than simply state the [abstract idea] while adding the words 'apply it.'" *Id.* at 1294.

Courts implement Section 101 by analyzing the elements in the asserted patent claims—first identifying the abstract idea, law of nature, or natural product in the invention, and then asking, "[w]hat else is there in the claims before us?" *Mayo*, 132 S. Ct. at 1297. Each additional element is examined to see if it is "sufficient to transform the nature of the claim" and then all elements must be considered together "as an ordered combination." *Id.* at 1297-98. Where the patent claims an abstract idea and the additional elements "consist of well-understood, routine, conventional activity already engaged in by the scientific community" such that those elements, "when viewed as a whole, add nothing significant beyond the sum of their parts taken separately," then the claim is ineligible. *Id.* at 1298. A court following the methodology articulated in *Mayo* thus considers the claims "as a whole" (*ibid.*) and does not inappropriately "dissect the claims into old and new elements and then ... ignore the presence of the old elements in the analysis." *Diehr*, 450 U.S. at 188.

2.a. Alice is the owner of U.S. Patents No. 5,970,479, 6,912,510, 7,149,720, and 7,725,375, although there is no indication that it practices the claims asserted here. These patents share a "common specification" (Pet. 10; Pet. App. 154a), which describes multiple inventions, covered by two distinct sets of claims.

The first set of claims, which Alice *does not assert* in this litigation—claims 1-32 and 35-39 of the '479 Patent—pertains to "the formulation of customized multi-party risk management contracts having a future time of maturity." *See*, *e.g.*, '479 Patent, claim 1. Most of the specification, and the great majority of the drawings, relates to this set of *unasserted* claims.

The second set of claims, which *are* at issue here—claims 33 and 34 of the '479 Patent and all claims of the '510, '720, and '375 Patents—focuses on a method for performing "a form of escrow" (Pet. App. 28a) designed to mitigate the risk that only one party to a transaction will perform its contractual obligations at settlement, as well as computer-readable media and computer systems capable of storing and running programming instructions for performing that escrow method: The '479 and '510 Patents contain method claims; the '720 Patent contains system claims; and the '375 Patent contains both system and media claims. The asserted claims are addressed in only limited portions of the specification. *See* '479 Patent, col. 5:61-6:24, 7:32-8:42, 24:56-28:20; '510 Patent, col. 5:21-5:23; 6:64-8:10, 28:43-32:6; '720 Patent, col. 5:27-5:29; 5:60-6:18; 7:32-8:42, 29:4-32:35; '375 Patent, col. 5:17-5:19; 5:50-6:8; 7:21-8:29, 28:60-32:24. In the court below, Alice maintained that Figures 25 and 33-37 of each patent (and no others) are associated with the asserted claims. *See* Alice Supp. C.A. Br. 31; *see also* '479 Patent, col. 51:16-51:25, 52:57-53:47; '510 Patent, col. 54:50-

54:59, 56:24-57:14; '720 Patent, col. 26:3-26:11, 57:43-58:33; '375 Patent, col. 55:44-55:53, 57:16-58:5 (discussing those drawings).

b. Chartered as an Edge Corporation under Section 25A of the Federal Reserve Act, CLS Bank was established in the late 1990s by the international banking community, in cooperation with a number of central banks, as a payment system to mitigate risk in the foreign exchange market. CLS Services is located in London and provides support and technology-related services to CLS Bank. Both respondents work to mitigate settlement risk—the risk that one counterparty will transfer its funds and the other will fail to do so—in global transactions by ensuring that both parties have fulfilled certain payment obligations under CLS Bank's rules before directing the exchange of currencies.

CLS plays a critical role in the safety of the global currency exchange market. Following the collapse of Lehman Brothers in September 2008, for example, CLS ensured that the foreign exchange market continued to function without disruption—just months after it had settled a record $10.3 trillion of transactions in one day. *See* CLS, History, www.cls-group.com/About/Pages/History.aspx (last visited Nov. 5, 2013). In July 2012, CLS Bank was one of the eight entities initially designated by the Financial Stability Oversight Council, which is chaired by the Secretary of the Treasury under the Dodd-Frank Act, as a "systemically important" financial market utility to the U.S. financial system. *See* Financial Stability Oversight Council Makes First Designations in Effort to Protect Against Future Financial Crises, www.treasury.gov/press-center/press-releases/pages/tg1645.aspx (July 18, 2012). In recognition of its systemic importance, CLS Bank has been issued similar designations in other jurisdictions as well. It also is subject to cooperative oversight by central banks from twenty-two countries pursuant to an arrangement coordinated by the Federal Reserve.

3. After Alice threatened a patent-infringement suit, CLS Bank initiated this declaratory judgment action to secure a judicial determination that Alice's patents are invalid and/or unenforceable, and that its business activities do not infringe any of those patents. Alice counterclaimed for infringement against both respondents, asserting claims 33 and 34 of the '479 Patent and all claims of the '510, '720, and (later) '375 Patents.

CLS and Alice filed cross-motions for summary judgment on whether the asserted claims are patent-ineligible. For that limited purpose, the parties stipulated that the '510 Patent "require[s] the use of a computer." Pet. App. 156a. No other claim limitations were disputed for purposes of the Section 101 analysis.

Following this Court's ruling in *Bilski*, the district court issued an exhaustive opinion concluding that the asserted claims are not patent-eligible because they recite "the abstract idea of employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk"—*i.e.*, escrow—and the claimed "incarnation of this abstract idea on a computer" was an insufficient basis to award a patent monopoly. Pet. App. 214a, 231a.

With respect to the method claims, the district court determined that computer implementation "fails to limit" the abstract idea because the method "could be performed without use of a computer" and the claims foreclosed the only practical means of implementing the idea. Pet. App. 210a, 221a. After extensively analyzing the asserted claims and their limitations, the district court concluded that the system claims too "represent merely the incarnation of this abstract idea on a computer" and "would preempt the use of the abstract concept" of escrow "on any computer, which is, as a practical matter, how these processes are likely to be applied." *Id.* at 231a. The court found that the media claims "are also directed to the same abstract concept despite the fact they nominally recite a different category of invention under § 101." *Id.* at 237a. The court accordingly granted respondents' motion for summary judgment. *Id.* at 238a.

4. A divided panel of the Federal Circuit reversed. Judge Linn, joined by Judge O'Malley, concluded that it was not "manifestly evident that the claims are patent ineligible under § 101." Pet. App. 160a. Judge Prost dissented. *Id.* at 160a-71a. All three members of the panel agreed that, in the context of the patents-in-suit, the system and media claims would stand or fall with the method claims. *Id.* at 154a, 168a-69a.

5. The Federal Circuit granted CLS's petition for rehearing en banc, vacating the panel decision and requesting additional briefing. Pet. App. 239a-41a. In addition to the parties' briefs, 26 amicus briefs—including one setting forth the views of the United States—were filed with the en banc court. After argument, the en banc Federal Circuit affirmed the district court's judgment. *Id.* at 1a-2a.

The ten-member court, as then constituted, included nine active judges and Senior Judge Linn (the author of the panel opinion). All ten judges joined a brief per curiam opinion and judgment stating:

> Upon consideration en banc, a majority of the court affirms the district court's holding that the asserted method and computer-readable media claims are not directed to eligible subject matter under 35 U.S.C. § 101. An equally divided court affirms the district court's holding that the asserted system claims are not directed to eligible subject matter under that statute.
>
> AFFIRMED

Pet. App. 1a-2a.

In addition to this judgment order, members of the en banc court also issued six separate opinions, none of which commanded a majority.

a. In the lead opinion, Judge Lourie, writing for a five-member plurality, explained that petitioner's claims draw on the "abstract idea" of "reducing settlement risk by facilitating a trade through third-party intermediation"—a form of the economic concept known as escrow. Pet. App. 28a. Moreover, "adding generic computer functions to facilitate performance provides no substantial limitation and therefore is not 'enough' to satisfy § 101" and its underlying concern that the patentee not foreclose more innovation than his contribution to progress could proportionally justify. *Id.* at 31a. The claims "formally drawn to physical objects"—the media and system claims—fared no better. *Id.* at 36a. They cover the same idea as the method claims and "provide for computer implementation at an incrementally reduced, though still striking level of generality": They "recite a handful of computer components in generic, functional terms that would encompass any device capable of performing" the computer-implemented methods. *Id.* at 37a.

b. Chief Judge Rader concurred-in-part and dissented-in-part. In an opinion joined in relevant part by Judge Moore, he agreed with the plurality that the method claims, as well as some of the claims formally drawn to physical objects—the media claims—were ineligible. Pet. App. 80a-85a. But he would have held the system claims patent-eligible. *Id.* at 41a-80a. He reasoned that those claims recited tangible components used in computers, such as a "data storage unit," and that such physical things could not be an abstract concept. *Id.* at 70a. Further, he disagreed with the plurality that the eligibility inquiry should be informed by whether the claims contain an "inventive concept": "whether a new process, machine, and so on is 'inventive' is not an issue under Section 101," he contended. *Id.* at 45a-46a.

c. Judge Moore, joined by Chief Judge Rader along with Judges Linn and O'Malley, wrote a separate partial dissent. She noted (writing before *Myriad*) that this Court "has taken a number of [the Federal Circuit's] recent decisions and, in each instance, concluded that the claims at issue were not patent-eligible," which, she wrote, had the potential of "causing a free fall in the patent system." Pet. App. 85a. The proper means of challenging claims to computer-implemented ideas is not Section 101, she reasoned, but the statute's "other requirements for patent protection." *Id.* at 99a. Because physical items could never be "abstract," Judge Moore argued, claims to a tangible computer system were for that reason patent-eligible. *Id.* at 86a-87a, 97a.

d. Judges Linn and O'Malley dissented; they would have held all of the asserted claims patent-eligible. They reasoned that the parties' stipulation to a claim construction including computer implementation required the court to apply the limitations in the system claims to all other claims. Pet. App. 123a-24a. Because they agreed with Judges Rader and Moore that the system claims were eligible, the other claims were therefore eligible as well. *Id.* at 126a.

e. Judge Newman too dissented. She wrote that "Section 101 is not the appropriate vehicle for determining whether a particular technical advance is patentable"; rather, "when the subject matter is within the statutory classes in section 101, eligibility is established." Pet. App. 101a, 111a.

f. Finally, Chief Judge Rader offered some "additional reflections" concerning the history of Section 101 jurisprudence. Pet. App. 126a-31a.

ARGUMENT

The petition for a writ of certiorari should be denied, both because the judgments below are correct and because the issue of the patent-eligibility of computer-implemented inventions would benefit from further percolation in the Federal Circuit. If the Court is inclined to wade back into the Section 101 waters, however, this case presents an appropriate vehicle for further elucidating the patent-ineligibility of claims that recite an abstract economic idea implemented using a generic computer.

I. THE COURT OF APPEALS CORRECTLY CONCLUDED THAT THE ASSERTED CLAIMS ARE NOT PATENT ELIGIBLE

The claims asserted here, like the patent application in *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010), easily "can be rejected under [the Court's] precedents on the unpatentability of abstract ideas." *Id.* at 3231. As both principal opinions below recognized, Alice's claims recite the abstract economic concept of intermediated settlement, or "escrow." Pet. App. 28a (opinion of Lourie, J.), 82a (opinion of Rader, C.J.). That they are implemented using a generic computer adds nothing to patent-eligibility.

A. The Method Claims Are Ineligible

As a clear majority of the en banc Federal Circuit—seven of the ten judges who heard this appeal—agreed, Alice's method claims are patent-ineligible under this Court's precedents. *See* Pet. App. 3a n.1 (opinion of Lourie, J.).

1. Alice's method claims are conceptually indistinguishable from those this Court held ineligible in *Bilski*. Both Alice's patents and Bilski's patent application cover a "fundamental economic practice." 130 S. Ct. at 3231. In Bilski's claims, that economic concept was "hedging," while in Alice's claims it is a different form of "protecting against risk" (*ibid.*), namely "a form of escrow." Pet. App. 28a (opinion of Lourie, J.). But the claims are logically and legally indistinguishable from one another. *See* CLS Supp. C.A. Br. 38 (chart comparing claim limitations in Bilski's application and Alice's patents). Although the principal opinions below differ from one another in certain respects, on this point they are in agreement.

a. As Judge Lourie explained for the plurality, the claims "presented here closely resemble those in *Bilski*." Pet. App. 31a. Both "explain[ ] a 'basic concept of ... protecting against risk.'" *Ibid.* (quoting *Bilski*, 130 S. Ct. at 3231). Indeed, as Judge Prost explained, the idea of escrow that Alice claims "is not just abstract; it is also literally ancient." *Id.* at 163a. Alice's claims, like Bilski's, explain this "basic concept" by breaking it into steps. The claims recite the "creat[ion]" and "adjustment" of "shadow records," which then serve as the basis for "instruct[ions]" to reconcile with real-world accounts. *Id.* at 26a-27a (opinion of Lourie, J.). But although they use many words, the "extravagant language" of Alice's claims just describes an "escrow arrangement." *Id.* at 30a.

Thus, Judge Lourie continued, "[a]s in *Bilski*, upholding Alice's claims to methods of financial intermediation 'would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.'" Pet. App. 31a (quoting *Bilski*, 130 S. Ct. at 3231). Reciting a computer does not practically limit the scope of the claims. *Id.* at 29a-30a. Although Alice's claims "could be performed without use of a computer," as its expert conceded in the district court (*id.* at 210a), Alice's claims—like Bilski's—require computer implementation as a *practical* matter. In *Bilski*, "any practicable embodiment would be conducted with the aid of a machine—a programmed computer." *In re Bilski*, 545 F.3d 943, 996 (Fed. Cir. 2008) (en banc) (Newman, J., dissenting). In this case too, "essentially all practical, real-world applications of the abstract idea implicated here would rely, at some level, on basic computer functions." Pet. App. 29a (opinion of Lourie, J.). To be sure, here the parties stipulated to this practical necessity for computer implementation, rather than leaving it implicit. In the district court, "the parties agreed for purposes of deciding their summary judgment motions that Alice's claims should all be interpreted to require a computer." *Id.* at 6a. But the effect is the same: both Bilski's and Alice's claims would foreclose the public from using any practical application of a fundamental economic concept, namely one that uses a computer.

b. Chief Judge Rader (joined by Judge Moore) agreed with the plurality that Alice's claims "describe[ ] the general and theoretical concept of using a neutral intermediary in exchange transactions to reduce risk that one party will not honor the deal, *i.e.*, an escrow arrangement." Pet. App. 82a. Indeed, he noted that "[t]he record in this case shows that this area of art has used the fundamental concept of an intermediary in this context for centuries, if not longer." *Ibid.* He further agreed that, although Alice's method claims, like Bilski's, are broken into steps—they do not "simply state 'use an escrow'" (*ibid.*) or "use hedging"—that drafting trick does not suffice to confer patent-eligibility. *Id.* at 83a. Because "each step individually recites merely a general step inherent within the concept of an escrow," those steps do not add anything to the analysis. *Ibid.*

Accordingly, in analyzing the method (and media) claims, Chief Judge Rader and Judge Moore acknowledged that, "[v]iewed as a whole, the claim[s] [are] indistinguishable from the claim in *Bilski*." Pet. App. 84a.

2. Although *Bilski* is sufficient to sustain the judgment below, that outcome also is dictated by this Court's further explication of the eligibility inquiry two Terms ago in *Mayo Collaborative Services* v.

Prometheus Laboratories, Inc., 132 S. Ct. 1289 (2012). In *Mayo*, the Court explained that merely adding conventional elements to an abstract idea, without a contribution to the Progress of Science and useful Arts proportional to the amount of innovation foreclosed, cannot render a claim patent-eligible. *Id.* at 1301-03. Even if the patentee has recited an "important and useful" advancement, the patent will not clear the Section 101 threshold without "an act of invention." *Ass'n for Molecular Pathology* v. *Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2117 (2013).

Alice fails to acknowledge that *Mayo* both refined and applied the methodology for analyzing eligibility under Section 101, requiring a court to examine each element individually and then all elements together as a whole for an "inventive concept" that would contribute "significantly more" than the abstract idea itself. *Mayo*, 132 S. Ct. at 1294, 1297-98. Following this methodology, Judge Lourie held that Alice's claims did not contain significantly more than the abstract idea of escrow. Pet. App. 20a-41a. (Chief Judge Rader, in contrast, did not apply *Mayo* in his separate opinion. *Id.* at 64a-65a.)

Alice's claims involve using a computer to create artificial ledger entries (sometimes referred to as "shadow records"), adjusting them, and then reconciling them with real-world accounts. Rather than adding limitations beyond the abstract idea, the steps of creating, adjusting, and reconciling the shadow records are just a way of *stating* the abstract idea of escrow. At most, creating a record is mere pre-solution data-gathering activity. Similarly, providing end-of-the-day instructions—which are simply instructions to reconcile the real-world account with the intermediary's ledger—is mere post-solution data-sharing activity. Adjusting the shadow records is the idea itself. Pet. App. 30a-31a (opinion of Lourie, J.). Moreover, the use of a general-purpose computer to create, adjust, and reconcile records is (and was at the time the patent application was filed and the time the patent issued) conventional. *Id.* at 29a-30a, 37a, 40a-41a; *see also Gottschalk* v. *Benson*, 409 U.S. 63, 71 (1972).

It is inconceivable that the outcome in *Mayo* would have been different if the diagnostic method at issue also recited "use a computer." Such use of a computer undoubtedly would have improved the speed and accuracy of the diagnostic method at issue there. But while generic computers are useful tools in the modern workplace and laboratory, they are ubiquitous; reciting them in a patent claim (without more) adds no more to patent-eligibility than reciting the use of a slide rule or protractor or sextant or any other conventional implement of the relevant art. The art here (economic transactions) frequently employs calculating devices including computers due to the speed, magnitude, or complexity of calculations, although all of them can be done (with more time) using pencil and paper—as the district court expressly recognized. Pet. App. 210a-11a (citing Alice's expert). The mere recitation of a generic computer adds nothing to the eligibility of an otherwise ineligible method.

It is for this reason that Alice's analogy (Pet. 26) to the rubber-curing machine in *Diamond* v. *Diehr*, 450 U.S. 175 (1981), is off-base: the process there added to the abstract idea of Arrhenius' equation more than "well-understood, routine, conventional activity, previously engaged in by those in the field." *Mayo*, 132 S. Ct. at 1299. For example, the claims in

Diehr required continual measurement of the temperature inside the press, which "the industry ha[d] not been able to" achieve before. 450 U.S. at 178 & n.3. These steps thus "added to the formula something that in terms of patent law's objectives had significance—they transformed the process into an inventive application of the formula." *Mayo*, 132 S. Ct. at 1299. In contrast, the claims here add nothing to the abstract idea of escrow other than the recited use of a conventional generic computer—much as the claims in *Parker* v. *Flook* added only "conventional methods of changing alarm limits" to a "mathematical algorithm." 437 U.S. 584, 586 (1978). That does not suffice: Just as "one must do more than simply state [a] law of nature while adding the words 'apply it'" (*Mayo*, 132 S. Ct. at 1294), one must do more than simply state an abstract idea while adding words that amount to "compute it."

B. The System And Media Claims Are Ineligible

The system and media claims asserted by Alice in this case are ineligible for the same reason as the asserted method claims. Eight of the ten judges participating in the decision below agreed that all the asserted claims should stand or fall together, regardless of statutory category. *See* Pet. App. 3a n.1 (opinion of Lourie, J.). That is correct in the context of these patents.

This Court has recognized that it is a simple task to "draft" one's "patent claims to describe" either "a method" or "an apparatus." *Quanta Computer, Inc.* v. *LG Elecs., Inc.*, 553 U.S. 617, 629 (2008). Indeed, "[a]pparatus and method claims may approach each other so nearly that it will be difficult to distinguish the process from the function of the apparatus."

Ibid. (internal quotation marks omitted). Eligibility under Section 101 does not (and cannot) turn on claim form: This Court's "cases warn us against interpreting patent statutes in ways that make patent eligibility depend simply on the draftsman's art." *Mayo*, 132 S. Ct. at 1294 (internal quotation marks omitted).

This case demonstrates why the draftsman's art cannot transform an ineligible method claim into an eligible system or media claim. The media and system claims suffer the same weaknesses as the method claims. The components they describe in functional terms—such as "a computer readable storage medium" (in the language of the media claims) or "a data storage unit" (in the language of the system claims)—are generic, and found in every modern computing device. Pet. App. 33a, 37a, 39a (opinion of Lourie, J.). The additional requirements of the media and system claims—such as a hard drive—are conventional, not inventive.

Both system and media claims are drawn to the same statutory categories, covering tangible objects—a "machine, manufacture, or composition of matter." 35 U.S.C. § 101. Indeed, the media claims' "computer readable storage medium" and the system claims' "data storage unit" could be the *same* generic hardware component—a hard drive or other means for storing the program for performing the claimed method.

Alice conceded below that "the exceptions to patent eligibility, including the 'abstract idea' exception, apply with equal force to claims drawn to the four different statutory categories." Alice Supp. C.A. Br. 46 (citing *Benson*, 409 U.S. at 67-68). Alice admitted that its media claims must stand or fall with its method claims (*id.* at 49-50 & n.3), and yet argued that its "computer system claims are patent-eligible *because they claim tangible machines, irrespective of what the computer is configured to do*" (*id.* at 35 (emphasis added)). At that level of generality, Alice has to be wrong: Otherwise every abstract idea could be patented by the trivial expedient of coupling the idea with generic computing devices in the claims.

Alice has never satisfactorily explained how its ineligible media claims could be transmogrified into eligible system claims simply by adding a generic computer processor to the media claims' generic means of data storage. (Nor did Chief Judge Rader and Judge Moore, the only two members of the en banc Federal Circuit to conclude that the eligibility of Alice's claims varied by statutory category. *See* Pet. App. 41a-99a.) As the Federal Circuit has recently reaffirmed, "simply implementing an abstract concept on a computer, without meaningful limitations to that concept, does not transform a patent-ineligible claim into a patent-eligible one." *Accenture Global Servs., GmbH* v. *Guidewire Software, Inc.*, 728 F.3d 1336, 1345 (Fed. Cir. 2013) (citing *Bancorp Servs., LLC.* v. *Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1280 (Fed. Cir. 2012)). Just as Benson's attempt to tie his claim to a common physical computer component of the day (a "reentrant shift register") failed to render his claim 8 patent-eligible (409 U.S. at 71-73), so too Alice's attempt to tie its claim to today's even more pedestrian generic computer fails to render its claims eligible. Tangibility does not equate to eligibility.

C. The Judgments Below Serve The Objectives Of Section 101

The judgments here advance the constitutionally grounded policy concerns underlying Section 101: ensuring that a patentee cannot preclude an entire realm of future innovation while contributing very little to the development of those inventions. *See* Mark A. Lemley et al., *Life After* Bilski, 63 Stan. L. Rev. 1315, 1317 (2011) ("what really matters" in the Section 101 analysis is "whether the scope of the patentee's claims is commensurate with the invention's practical, real-world contribution"). That goal emanates from the Constitution's grant of congressional power to protect intellectual property:

> Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which by constitutional command must "promote the Progress of ... useful Arts." This is the *standard* expressed in the Constitution and it may not be ignored. And it is in this light that patent validity requires reference to a standard written into the Constitution.

Graham v. *John Deere Co. of Kansas City*, 383 U.S. 1, 6 (1966) (internal quotation marks omitted).

A determination that any of the claims asserted here are patent-eligible would hamper, rather than promote, technological advancement. If a person could lay claim to future innovations just by recording the *idea* for such innovations in a patent application, the exclusive right the patentee obtained would destroy the incentive to actually develop viable products. Lemley, *supra*, at 1331; *see also*

O'Reilly v. *Morse*, 56 U.S. (15 How.) 62, 115-20 (1853).

Only Section 101 is "equipped" to perform the "screening function" of weeding out patents that preempt too much innovation "relative" to their contribution. *Mayo*, 132 S. Ct. at 1303-04. Sections 102 and 103 ensure that the claim is sufficiently distinct from the prior art; they do not enforce the "bright-line prohibition against patenting laws of nature, mathematical formulas and the like." *Id.* at 1303. And "enablement does not provide enough of a limitation on scope as the level of skill in the art goes up"; the eligibility question is "not whether one could make the embodiments claimed, but rather whether the inventor has contributed enough to merit a claim so broad that others will be locked out." Lemley, *supra*, at 1330. As this Court has summarized, Section 112 does not address the risk that underlies the eligibility "exception, namely the risk that a patent on the law would significantly impede future innovation." *Mayo*, 132 S. Ct. at 1304 (citing Prof. Lemley's analysis on this issue). Thus, while the inquiries under Sections 101, 102, 103, and 112 "might sometimes overlap," the latter provisions "are not equipped" to supplant the eligibility determination required by Section 101. *Id.* at 1304.

In the context of information technology, it is especially important that patents should protect those who contribute, not those who merely describe. As a group of innovative companies explained to the en banc Federal Circuit, patents like Alice's contribute only the "easy" task of "think[ing] of abstract ideas about what a computer or website should do," but "leave to others the truly innovative work of developing applications of the idea." Google et al. Supp.

C.A. Br. 23-24; *see also* BSA | The Software Alliance Supp. C.A. Br. 15-25. That is the outcome Section 101 is designed to prevent.

Although Alice observes that its common specification "contains flowcharts that provide algorithm support for the specific programming to implement functions recited in the claims" (Pet. 10), those diagrams do not refer to the *asserted* claims. As is common practice today, the patentee wrote a broad specification covering multiple inventions, which are described in separate sets of claims. *See Stiftung* v. *Renishaw PLC*, 945 F.2d 1173, 1181 (Fed. Cir. 1991). The patent drawings illustrate the operation of *non-asserted* claims involving "the formulation of customized multi-party risk management contracts having a future time of maturity." *See*, *e.g.*, '479 Patent, claim 1. They include flowcharts dealing with, for example, "[p]ick[ing] [the] lowest priced counterparty" from a "short list" (Pet. App. 96a (opinion of Moore, J.)) based on factors such as the "matching counterpart[ies']" "consideration" to *form* (rather than settle) an "order" (*id.* at 75a (opinion of Rader, C.J.)). This language pertains to the non-asserted contract "formulation" claims, which recite, for example, "pricing and matching contracts" by "calculating a counter-consideration" in order "to match an offered contract with at least one of said counter-party stakeholders." '479 Patent, claim 1. In the court below, Alice identified all of the drawings that pertain to the asserted claims (*see* Alice Supp. C.A. Br. 31), and the flowcharts reproduced in the dissenting opinions below (Pet. App. 74a-76a, 96a-97a) are not among them.

Similarly unsupported is Alice's assertion that the patent applicant, Ian Shepherd, "built" any embodiment of the claimed system. Pet. 6. The record contains no evidence (or even allegation) of such an event, and in recounting the history of the invention to the district court Alice stated only that Shepherd "conceived" of the *idea* for the system. C.A. J.A. 113-14. Shepherd, like Bilski, wrote "concept" patents describing an *idea* to perform a fundamental economic process. The process itself has existed for "centuries" (Pet. App. 82a (opinion of Rader, C.J.)); there is nothing inventive in the asserted claims. Alice's patents recite nothing other than a business method and the generic hardware to store and perform that method; but the programming is not disclosed—because it was not invented by the patent applicant, and to this day there is no indication that Alice practices the asserted claims.

Alice's patents do not contribute anything to society, but rather seek to foreclose well-understood and conventionally utilized mechanisms for resolving financial transactions involving "an infinite array of tangible and intangible representations of value." Pet. App. 219a. Because, as the district court found, such transactions "are increasingly likely to be monopolized by electronic and computer implementation and storage, the fact these claims are implemented electronically fails to limit the methods." *Id.* at 221a. Moreover, Alice's patents are not even "limited to any particular industry," but rather sweep "across an incredible swath of the economic sector." *Id.* at 218a, 221a. They exemplify the concern expressed by this Court that a patent not "pre-empt" the practical use of an abstract idea. ***Diehr***, 450 U.S. at 187; ***Flook***, 437 U.S. at 589-90; ***Benson***, 409 U.S. at 71-72; ***Morse***, 56 U.S. (15 How.) at 117.

Alice's claims could be held patent-eligible only if this Court were willing to sanction a return to the period during which the exception to Section 101 was "a dead letter." *Mayo*, 132 S. Ct. at 1303. This Court has repeatedly, and unanimously, declined to sound such a retreat—and for good reason. *See id.* at 1303-05; *Myriad*, 133 S. Ct. at 2116-19.

II. THIS COURT'S REVIEW IS NOT NEEDED NOW

Although the Federal Circuit split evenly as to *one* statutory class of claims asserted here, a clear majority of the judges agreed that Alice's media and method claims were ineligible and a clear majority agreed that those claims must stand or fall together with the system claims. Pet. App. 3a n.1 (opinion of Lourie, J.). To the extent there are some differences in the rationales set forth in the various opinions, they will be—and already are being—sorted out by the Federal Circuit itself.

1. This Court regularly denies review of issues that divide a court of appeals, including when it sits en banc. *See, e.g., Sch. Dist. of City of Pontiac* v. *Duncan*, 130 S. Ct. 3385 (2010); *Edwards* v. *Kenyon*, 552 U.S. 1038 (2007); *Childress* v. *City of Richmond*, 524 U.S. 927 (1998); *Battle* v. *Lubrizol Corp.*, 466 U.S. 931 (1984); *Roesch, Inc.* v. *Star Cooler Corp.*, 466 U.S. 926 (1984); *Mandel* v. *United States*, 445 U.S. 961 (1980); *Clavey* v. *United States*, 439 U.S. 954 (1978); *Gordon* v. *United States*, 422 U.S. 1057 (1975). If anything, an evenly divided en banc panel shows that further development in the court of appeals is warranted before this Court should undertake review. "It is primarily the task of a Court of Appeals to reconcile its internal difficulties." *Wisniewski* v. *United States*, 353 U.S. 901, 902 (1957) (per curiam).

Since this case was argued below, three more judges (Judges Taranto, Chen, and Hughes) have been confirmed and sworn into the Federal Circuit, giving the court its full complement of active judges. These new members have not yet had the opportunity to address questions of patent-eligibility. They come from diverse backgrounds—Judge Taranto was an appellate litigator in private practice; Judge Chen was solicitor of the PTO; and Judge Hughes was a career attorney in the Justice Department's commercial litigation branch—and may provide fresh perspectives on the issues. The addition of these three judges answers Alice's lament that the Federal Circuit is "hopelessly fractured" (Pet. 20); the reconstituted court is capable of settling its own internal divisions.

United States v. *Weaselhead* is instructive. In that case, the en banc Eighth Circuit divided 5-5 on the question whether the Double Jeopardy Clause forbade prosecution of a non-tribal member by both a tribal court and a federal court. 165 F.3d 1209 (8th Cir. 1999) (en banc) (per curiam). This Court denied review. 528 U.S. 829 (1999). Four years later, after Judges Beam, Fagg, and Richard S. Arnold took senior status and Judges Bye, Riley, Mellow, and Smith joined the court, the Eighth Circuit again sat en banc and resolved the issue 7-4. *See United States* v. *Lara*, 324 F.3d 635 (8th Cir. 2003) (en banc). At that point, this Court granted review. *See* 539 U.S. 987 (2003). Similarly, in *Hayden* v. *Pataki*, the en banc Second Circuit resolved an issue that had previously resulted in an en banc tie. 449 F.3d 305, 313 (2d Cir. 2006) (en banc) (citing *Baker* v. *Pataki*, 85 F.3d 919 (2d Cir. 1996) (en banc) (per curiam)). Here, three new judges have joined the appellate court and Senior Judge Linn is unlikely to participate in future en banc decisions. The Court should give the newly constituted Federal Circuit the opportunity to resolve any open issues in the first instance.

2. The Federal Circuit has issued two precedential decisions in the months following the en banc decision in this case. *See Ultramercial, Inc.* v. *Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013) ("*Ultramercial II*"); *Accenture*, 728 F.3d 1336. One holds the claims at issue eligible, and the other holds them ineligible. *See Ultramercial II*, 722 F.3d at 1354; *Accenture*, 728 F.3d at 1346. Judge Lourie sat on both panels, and found Ultramercial's claims eligible but Accenture's ineligible. He explained why the same rule of law, requiring "significantly more than the underlying abstract concept," supports both outcomes. *Accenture*, 728 F.3d at 1345 (internal quotation marks omitted). Chief Judge Rader also sat on both panels.

To be sure, in the two cases, Judge Lourie and Chief Judge Rader reiterated their differing articulations of the eligibility test. *Compare Ultramercial II*, 722 F.3d at 1342 ("because eligibility requires assessing judicially recognized exceptions against a broad and deliberately expanded statutory grant, one of the principles that must guide our inquiry is these exceptions should apply narrowly"), *with Accenture*, 728 F.3d at 1341 ("the court must determine whether the claim poses any risk of preempting an abstract idea") (internal quotation marks omitted). In particular, these two jurists continue to approach differently *Mayo*'s requirement for an "inventive concept" contributing "significantly more" than an abstract idea. *Compare Ultramercial II*, 722 F.3d at 1348 ("the Supreme Court's reference to 'inventiveness' in *Prometheus* can be read as shorthand for its inquiry into whether implementing the abstract idea in the context of the claimed invention inherently requires the recited steps"), *with Accenture*, 728 F.3d at 1345 ("Accenture's claims do not contain significantly more than the underlying abstract concept") (internal quotation marks omitted).

Still, the new decisions do answer some questions left open after the en banc decision in this case. They each resolve different aspects of eligibility jurisprudence: *Ultramercial II* provides guidance on the appropriate procedural posture for raising the issue (722 F.3d at 1338-40), and *Accenture* explains when system claims are ineligible by virtue of their similarity to ineligible method claims (728 F.3d at 1340-44). Moreover, a petition for rehearing en banc has been filed in *Accenture* and the Federal Circuit recently requested a response to that petition.

A number of other cases presenting patent-eligibility issues remain pending in the Federal Circuit. In one case, the court summarily affirmed a dismissal on the ground that the patents were ineligible for claiming a computer-implemented economic idea. *Sinclair-Allison, Inc.* v. *Fifth Ave. Physician Servs., LLC*, — F. App'x —, 2013 WL 5094521 (Fed. Cir. 2013) (per curiam). Two others present patents that the district court held ineligible for claiming a computer-implemented economic idea. *OIP Techs., Inc.* v. *Amazon.com, Inc.*, No. 12-1696 (Fed. Cir.) and *Fed. Home Loan Mortg. Corp.* v. *Graff/Ross Holdings LLP*, No. 13-1067 (Fed. Cir.). Although the Federal Circuit has stayed both of these cases until this Court disposes of Alice's certiorari petition, denial would permit these cases to move forward and allow the Federal Circuit to resolve any lingering questions following the decision below. Still others have progressed far toward decisions. *See, e.g.*, *CyberFone Sys., LLC* v. *CNN Interactive Grp., Inc.*, No. 12-1673 (Fed. Cir.) (argued Nov. 4, 2013); *SmartGene, Inc.* v. *Advanced Biological Labs., SA*, No. 13-1186 (Fed. Cir.) (to be argued Dec. 2, 2013); *Cardpool, Inc.* v. *Plastic Jungle, Inc.*, No. 13-1227 (Fed. Cir.) (briefing completed Oct. 3, 2013); *buySAFE, Inc.* v. *Google, Inc.*, No. 13-1575 (Fed. Cir.) (appellant's brief filed Oct. 21, 2013). Many of these cases—*OIP*, *Sinclair-Allison*, *CyberFone*, *SmartGene*, and *buySAFE*—involve apparatus claims as well as process claims. Together, they present the prospect of further development of eligibility law in the Federal Circuit in the realm of computer-implemented claims.

3. This developing line of authority also answers Judge Moore's concern that the decision below could lead to "the death of hundreds of thousands of patents." Pet. App. 85a. The Federal Circuit's affirmance of the district court's (correct) judgment that the asserted claims of Alice's patents are ineligible under Section 101 has not resulted in the wholesale ineligibility of computer-implemented business method patents. The Federal Circuit continues to evaluate the particular patents before it on a case-by-case basis, finding some eligible and others ineligible. *Compare Ultramercial II*, 722 F.3d at 1355, *with Accenture*, 728 F.3d at 1346. Nor does the decision below speak broadly to the eligibility of "software patents." In this case, Alice does not purport to claim a new software invention; rather, the asserted claims describe a business method and generic hardware for implementing the method, without any programming instructions.

Moreover, the judgment below has not compromised the PTO's ability to evaluate patent applications claiming computer-implemented methods. Shortly after the Federal Circuit's decision, the PTO concluded that it need not materially alter its post-*Bilski* guidance for examining applications containing such claims. Memorandum from Andrew H. Hirshfeld, Deputy Commissioner for Patent Examination Policy, to Patent Examining Corps (May 13, 2013) (noting "agreement" among the Federal Circuit judges on "several important themes," including that one must analyze "the claim as a whole" to determine if "additional limitations add significantly more" than "the abstract idea"). Furthermore, Congress recently enacted legislation authorizing a new administrative review procedure for certain issued business method patents. Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 18, 125 Stat. 284, 329-31; 37 C.F.R. §§ 42.300-42.304. This should allow the PTO additional opportunity to evaluate the patent-eligibility of computer-implemented methods.

Such case-by-case evolution is precisely what this Court's Section 101 precedents require. This Court has instructed that bright-line tests are inappropriate to determine patent-eligibility, which is better suited for case-by-case analysis and development. *Bilski*, 130 S. Ct. at 3231 (deciding the case before it on the basis of existing precedent and leaving "the Federal Circuit's development" of Section 101 to "its case law," rather than through "an exclusive ... test"). Underscoring this point, the PTO has said that it too is willing to await future "case-by-case" development, rather than setting out "a rigid, bright line test." Hirshfeld Memo, *supra*. To the extent petitioners and their amici complain of "uncertainty" resulting from the decision below, they are really just complaining of the incremental approach this Court has adopted for Section 101 issues.

This Court has reinvigorated Section 101 in recent years, providing significant guidance to the Federal Circuit with three decisions—*Bilski*, *Mayo*, and *Myriad*—that were unanimous in result. The Federal Circuit is internalizing and applying that guidance in a variety of contexts, including computer-implemented inventions. While this Court could well be called upon to review the patent-eligibility of such inventions in due course, it seems premature to do so at this time.

III. SHOULD THE COURT CHOOSE TO REVISIT THE PATENT-ELIGIBILITY OF ABSTRACT ECONOMIC IDEAS, THIS CASE WOULD BE AN APPROPRIATE VEHICLE

If the Court were to determine that the patent-eligibility of computer-implemented claims that are premised on abstract economic ideas does warrant additional review at this time, four recent decisions of the Federal Circuit—the en banc decision in this case, and the panel decisions in *Ultramercial II*, *Bancorp*, and *Accenture*—present variations on the theme. A certiorari petition has been filed in *Ultramercial II* (No. 13-255), Bancorp's petition is currently due November 8, 2013 (*see* No. 13A185), and *Accenture* is on petition for en banc rehearing in the Federal Circuit. Of these four cases, CLS respectfully submits that for several reasons this case would be the best vehicle for this Court's review.

First, since *Bilksi*, no economic method claims have received as extensive briefing and consideration of their eligibility as Alice's. This case was exhaustively briefed—by the parties and dozens of amici, including the United States government—in the court of appeals, and this Court would have the benefit of the views of all members of the Federal Circuit (as then constituted) on the patents asserted here. *See* NYIPLA Br. 17 (this case presents the Court with "plenty of material to draw upon in developing an instructive directive on this issue"). The district court's opinion too was exceptionally thorough, analyzing every claim—including all limitations—under both the Federal Circuit's and this Court's precedents. *See* Pet. App. 172a-238a. The other cases presenting similar issues, in contrast, were each decided by three-judge panels with no amicus participation at the time. Indeed, the Federal Circuit selected *CLS* for rehearing en banc over *Bancorp*, and denied rehearing en banc in that case following the *CLS* decision. *See* Order, *Bancorp*, 687 F.3d 1266 (No. 11-1467), ECF No. 4 (Fed. Cir. June 13, 2013). The petitioner in that case, Bancorp Services, now agrees that *CLS* "presents the best vehicle" for the Court to resolve the issue. *See* Trading Technologies et al. Br. 21-23.

Second, the Section 101 issue here was clearly framed on a motion for summary judgment addressing exclusively patent-eligibility. Claim construction was unnecessary, because CLS stipulated (for these purposes) to a construction favorable to Alice on the sole disputed limitation. The case thus presents a clean, purely legal issue without any alternative grounds or underlying factual disputes that could preclude the Court from reaching the question. *Cf.*, *e.g.*, *MySpace, Inc.* v. *GraphOn Corp.*, 672 F.3d 1250, 1255-64 (Fed. Cir. 2012) (engaging in claim construction and holding the claims invalid as anticipated or obvious, instead of ineligible, because the challenged summary judgment order presented those issues too). Other cases, by contrast, either suffer from a sparser district court record—for example, due to their motion-to-dismiss posture (*see*, *e.g.*, *Ultramercial II*, 722 F.3d at 1338-39)—or have lingering disputes over claim construction (*Bancorp*, 687 F.3d at 1280) or waiver (*Accenture*, 728 F.3d at 1347 (Rader, C.J., dissenting)).

Third, this case presents system and media claims in addition to method claims, thus affording the Court the opportunity to speak to each of the most common forms of drafting claims directed to computer-implemented inventions. This Court has already addressed the eligibility of method claims many times. *See*, *e.g.*, *Mayo*, 132 S. Ct. at 1294; *Bilski*, 130 S. Ct. at 3223; *Diehr*, 450 U.S. at 179 n.5; *Flook*, 437 U.S. at 585. A clear majority of the court below correctly determined that the method claims asserted by Alice are ineligible under those precedents. The Federal Circuit was "evenly divided" only as to Alice's *system* claims, yet some of the other pending cases—including *Ultramercial II*—do not involve system claims. This case would provide the Court with the opportunity to remind the Federal Circuit that "the same principle applies" in analyzing the eligibility of "a 'product' claim" as "a 'process' claim." *Benson*, 409 U.S. at 67-68.

Fourth, in contrast to some of the other pending cases, here it is clear that the asserted claims are premised on an abstract idea, namely escrow. Both of the principal opinions below—Judge Lourie's plurality and Chief Judge Rader's partial concurrence—agree that there *is* an underlying abstract idea, and both identify that idea as "a form of escrow." Pet. App. 28a; *accord id.* at 82a (Alice's claims cover "the general and theoretical concept of using a neutral intermediary in exchange transactions to reduce risk that one party will not honor the deal, *i.e.*, an escrow arrangement"). This clarity contrasts with other cases, where judges have found it murkier what the abstract idea at issue is (or if one is present at all), and have even voiced internal disagreement about how to identify that abstract idea. *See Ultramercial II*, 722 F.3d at 1350 n.2 ("it is arguable that we are not even dealing with an intangible abstraction in the first instance; the claims relate to things that people do, not to mere mental steps"); *Accenture*, 728 F.3d at 1344 (disagreeing with "the district court's abstract idea" and identifying a different idea that is "not as broad").

Fifth, the application of this Court's precedents to Alice's patent claims is relatively straightforward. Both Judge Lourie and Chief Judge Rader agreed that the *Bilski* framework applies to Alice's method claims. In addition, Judge Lourie's plurality opinion thoroughly but straightforwardly applied the rule of law announced in *Mayo* to Alice's claims, explaining well why each limitation in Alice's claims fails to provide "significantly more" than the abstract idea of escrow. Pet. App. 25a-41a. Even Judge Lourie, however, found it difficult to articulate *why* Ultramercial's claims contain "significantly more than the underlying abstract idea," beyond noting that they contain many limitations. *Ultramercial II*, 722 F.3d at 1355 (Lourie, J., concurring). This case provides the Court with a clean vehicle to apply its Section 101 jurisprudence, including but by no means limited to *Bilski* and *Mayo*, to the context of computer-implemented claims that are premised on abstract ideas.

In sum, if the Court decides not to await further percolation in the Federal Circuit, it should grant the petition for a writ of certiorari in this case (although it may wish to consider restating the question presented). If the Court grants the petition in *Ultramercial II*, it should *also* review the decision in this case to resolve the eligibility of system claims—the only issue on which the Federal Circuit is deadlocked. Indeed, this case—unlike the other candidates for review—presents asserted method, media, *and* system claims with virtually identical scope; involves an abstract idea that has been analyzed thoroughly, from a variety of perspectives, by the lower courts; and includes no confounding issues of claim construction, waiver, or the like that could preclude the Court from resolving the sources of disagreement within the Federal Circuit. Thus, to the extent the Court is concerned that the en banc Federal Circuit failed to provide adequate guidance to the bench, bar, and agency on the patent-eligibility of computer-implemented claims under Section 101, a decision in this case would provide such guidance.

CONCLUSION

The petition for a writ of certiorari should be denied.

Respectfully submitted.

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REPLY
BRIEF

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IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

REPLY IN SUPPORT OF PETITION

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REPLY IN SUPPORT OF PETITION

As the petition showed, there is universal agreement among academics, industry, the bench, and bar that this Court needs to review and set standards for determining the patent-eligibility of computer-implemented inventions. The urgency of that need has only become more painfully obvious in recent months. The Federal Circuit continues to issue irreconcilable panel opinions, with individual judges continuing to advance their personal views concerning the application of section 101 to computer-implemented inventions. *See* p. 3-4, *infra*. District courts and the PTO continue to operate in the dark. *See* p. 6-7, *infra*. And, as CLS points out, cases whose resolution turns on the question presented here continue to stack up, BIO 27-28, raising the prospect of yet more inconsistent, panel-dependent decisions by the Federal Circuit. The situation is intolerable, and only immediate review by this Court can bring meaningful clarity.

It is therefore unsurprising that some three dozen *amici* have, in eleven separate briefs, urged this Court to review the question presented here. What is particularly notable is that most of those *amici* have specifically urged the Court to grant review in *this* case, rather than the three similar cases in which petitions are pending or anticipated. *See, e.g.*, NYIPLA Br. 16-17 ("It is not insignificant that the Federal Circuit hand picked this case to address the patent-eligibility of computer-implemented inventions."); *accord* Trading Technologies Br. 21-22; IEEE Br. 24; Patent Law Students Br. 20. Most notable of all, *even CLS* agrees that this case is an excellent vehicle for the Court to address the patent-eligibility of computer-implemented inventions. BIO 33 ("if the

Court decides not to await further percolation in the Federal Circuit, it should grant the petition for a writ of certiorari in this case").

CLS's recognition that this case offers the Court a valuable opportunity to tackle the issue belies its contentions that certiorari is unwarranted, either because review now "seems premature," BIO 30, or because the judgment below is "correct," *id.* at 1. CLS's suggestion that through "further percolation" the Federal Circuit might "settl[e] its own internal divisions," *id.* at 1, 25, cannot be reconciled with that court's continuing stream of inconsistent, panel-dependent decisions. And, as the *amici* demonstrate, to prolong the current intolerable uncertainty while the supposed "percolation" occurred would impose substantial costs on innovators and industry. *See* p. 5-6, *infra.* Additionally, although CLS devotes the majority of its Brief in Opposition to arguing the merits, its arguments are both largely irrelevant to whether certiorari should be granted and fundamentally wrong. In short, the Brief in Opposition merely confirms that certiorari should be granted.

I. THIS COURT'S PROMPT REVIEW IS NEEDED TO PROVIDE CLARITY ON AN ISSUE OF GREAT IMPORTANCE.

CLS cannot dispute the importance of the question presented. Nor can CLS dispute that the "members of the en banc court" below "issued six separate opinions, none of which commanded a majority," BIO 9, demonstrating that "the Federal Circuit is 'hopelessly fractured'" on the question of patent-eligibility of computer-implemented inventions, *id.* at 25. At the same time, CLS concedes that this Court's review of the question may well be warranted "in due course," *id.* at 30, and that this case offers a "clean vehicle" for that review with no "confounding issues," *id.* at 33-34. That should be the end of the story.

Nonetheless, CLS asks the Court to deny the petition. In CLS's words, "[t]o the extent there are some differences in the rationales set forth in the various opinions, they will be—and already are being—sorted out by the Federal Circuit itself." BIO 24. Accordingly, CLS states, "it seems premature" to grant certiorari at this time. *Id.* at 30. CLS's artful phrasing cannot obscure either the irreconcilable division in the Federal Circuit or the urgent need for guidance from this Court.

CLS attempts to paint a rosy picture of the decision below, stating that "[a]lthough the Federal Circuit split evenly as to *one* statutory class of claims asserted here, a clear majority of the judges agreed that Alice's media and method claims were ineligible and a clear majority agreed that those claims must stand or fall together with the system claims." BIO 24. The statement is accurate, as far as it goes, but CLS omits to mention (1) that the majority of judges who concluded that all claims should be treated alike *disagreed* as to how they should be treated, and (2) that while particular outcomes garnered a majority below, *no majority* of judges could agree on any single rationale.

And since the decision below, the judges of the Federal Circuit have continued to apply their individual approaches, giving rise to entirely panel-dependent decisions. In *Ultramercial, Inc.* v. *Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013), Chief Judge Rader garnered a panel majority for his interpretation of section 101, while Judge Lourie wrote separately, stating, "I believe that we should ... track the plurality opinion of five judges from this court in *CLS Bank International v. Alice Corp.*" *Id.* at 1354

(Lourie, J., concurring). Three months later, in *Accenture Global Services, GmbH* v. *Guidewire Software, Inc.*, 728 F.3d 1336 (Fed. Cir. 2013), Judge Lourie garnered a panel majority for his reading of section 101, while Chief Judge Rader dissented, stating, "the court relies significantly on the framework proposed by the plurality opinion in *CLS Bank Int'l v. Alice Corp.* However, no part of *CLS Bank*, including the plurality opinion, carries the weight of precedent." *Id.* at 1346-47 (Rader, C.J., dissenting) (citation omitted).[1]

CLS calls the Federal Circuit's lurching from one reading of section 101 to another "case-by-case evolution." BIO 29. The problem, however, is that while each case comes out differently, there has been no "evolution" toward a consensus. Indeed, confusion has reigned in the Federal Circuit since this Court's decision in *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010). Pet. 21-24 (describing post-*Bilski* case law); *see also* Mark A. Lemley et al., *Life After* Bilski, 63 Stanford L. Rev. 1315, 1316-17 (2011) (describing "the post-*Bilski* confusion"). That confusion has only continued since the intervening decisions in *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012), and *Ass'n for Molecular Pathology* v. *Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013), and the addition of Judges O'Malley, Reyna, and Wallach to the Federal Circuit after *Bilski* was decided has done nothing to remedy the problem. There is thus no basis for CLS's speculation that the more recent addition of Judges Taranto, Chen, and Hughes to the court will magically make the current muddle disappear. *See* BIO 25.

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[1] *Bancorp Servs., LLC* v. *Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266 (Fed. Cir. 2012), in which a petition for certiorari was filed on November 8, 2013 (No. 13-584), offers further evidence of the Federal Circuit's inability to resolve the inconsistent approaches to patent eligibility. After holding Bancorp's petition for rehearing for more than a year while it decided this case, the Federal Circuit summarily denied the petition, leaving in place a panel decision that simply adopts one of the conflicting approaches presented in the en banc decision in this case. See *Bancorp,* No. 2011-1467 (Fed. Cir. June 13, 2013) (order denying rehearing).

Nor is there any reason to believe this Court's review on the merits will benefit from further "percolation." The appendix contains 171 pages of opinions on the issue presented. There are several other panel opinions on the subject, and the Court no doubt will have the benefit of dozens of briefs carefully examining every facet of the problems raised by the decision below. Whatever value percolation may have in other contexts, this coffee is fully brewed and ready to be consumed.

And, as the numerous *amici* have made clear, the confusion caused by the utter lack of consensus in the Federal Circuit has real, palpable effects each day that it is allowed to persist, which means that the continued "percolation" CLS advocates, even were it not entirely fanciful, would carry an unacceptably high price. *E.g.*, Accenture Br. 10 ("The impasse over § 101 at the Federal Circuit has created an intolerable environment for inventors and innovative companies developing new computer systems and software."); Trading Technologies Br. 16-17 ("The current confusion will have many negative impacts on business, including unpredictability at the USPTO regarding which patents it will not allow based on Section 101, unpredictability in litigation (including litigation involving patents that issued many years ago), unpredictability in new and old licensing transactions and the inability of businesses to efficiently allocate resources to research and development."). As the *amici* explain, as long as this disarray continues, every patent involving a computer-related invention—and, as Judge Moore noted below, there are hundreds of thousands (Pet. App. 86a n.1)—will be subject to potential section 101 attack, imposing intolerable burdens on district courts and stifling innovation by all but the most determined and well-financed inventors.

The *amici*'s concerns are underscored by the numerous cases pending in the Federal Circuit that present issues implicated here, and that raise the prospect of further confusion and more panel-dependent outcomes. *See* BIO 27-28. The concerns are likewise underscored by the repeated pleas from district courts for clear guidance on patent-eligibility of computer-implemented inventions. See, *e.g.*, *Planet Bingo, LLC v. VKGS, LLC*, 2013 WL 4427811, at *4 (W.D. Mich. Aug. 19, 2013) ("As a result of the Federal Circuit's present fractured state, this Court is left in a quandary."); *Zillow, Inc.* v. *Trulia, Inc.*, 2013 WL 5530573, at *2 (W.D. Wash. Oct. 7, 2013) ("Although the court had hoped that the Federal Circuit's en banc decision in *CLS Bank* would provide guidance with respect to the present dispute, its hopes were not to be realized."). And they are likewise underscored by the expressed uncertainty of the PTO, which acknowledged in its *amicus* brief below that "its longstanding approach to the eligibility of computer-implemented inventions is no longer sufficient," Brief for the United States as Amicus Curiae 5-6, yet received no guidance on a new approach from the Federal Circuit's decision, see Memorandum from Andrew H. Hirshfield, Deputy Commissioner for Patent Examination Policy, to Patent Examining Corps (May 13, 2013), *available at* http://www.uspto.gov/patents/law/exam/clsbank_2013

0513.pdf) (noting that "[g]iven the multiple divergent opinions, the USPTO is continuing to study the decision in *CLS Bank*").

Finally, and incredibly, CLS equates the fracture in the Federal Circuit to a mere intracircuit split, stating that this Court "regularly denies review of issues that divide a court of appeals." BIO 24. Of course, the Federal Circuit is the only appellate court to review patent cases, which means that no split between it and any of the regional circuits on an issue of patent law is possible—a fact CLS simply ignores as it cites denials of certiorari in cases presenting splits within regional circuits. *Id.* Indeed, there can be no deeper or more profound split on an issue of patent law than exists here: The judges of the Federal Circuit took this case en banc for the express purpose of resolving the patent-eligibility of computer-implemented inventions, but proved utterly unable to do so.

It is incumbent upon this Court to provide the guidance that the Federal Circuit could not. And, in CLS's words, "a decision in this case would provide such guidance." BIO 34.

II. THE DECISION BELOW WAS ERRONEOUS.

CLS devotes the bulk of its Brief in Opposition to arguing the merits, asserting that "the judgments below are correct." BIO 1. Of course, even if that were true, that would not be a reason to deny certiorari. *See* Robert L. Stern et al., *Supreme Court Practice* § 4.17 (8th ed. 2002) ("'[T]he fact that a case may have been rightly decided [is not] in itself enough to preclude certiorari.'") (quoting Justice Harlan, *Manning the Dikes*, 13 Record of N.Y.C. Bar Ass'n 541, 551 (1958)). Instead, the importance of the issue presented, and the total absence of clear guidance from the Federal Circuit on that issue, require this Court's immediate attention. Even if the Court were to affirm, which it will not, the Court's opinion will unquestionably offer more clarity than the per curiam disposition and six conflicting opinions below have provided.

Space does not permit a full rebuttal on the merits—that is the purpose of the next round of briefing—but CLS's most obvious mistakes warrant brief mention. First, CLS is flatly wrong in arguing that the asserted claims "attempt to monopolize the core economic idea of intermediated settlement, or escrow," and that the claims' "steps of creating, adjusting, and reconciling the shadow records are just a way of *stating* the abstract idea of escrow." BIO 1, 15. The dictionary definition of escrow is "a deed, a bond, money or a piece of property delivered to a third person to be delivered by him to the grantee only upon the fulfillment of a condition." *Webster's Seventh New Collegiate Dictionary* 283 (1972). Nothing in the concept of escrow requires electronic shadow records, or the particular use of electronic shadow records, required by Alice's patent claims. Moreover, Alice's claims do not prescribe that the electronic intermediary (or any other third party) receives any money or property, and the only "deliveries" (which result from the generation of instructions to the exchange institution) required by Alice's claims occur to the accounts of the actual parties after the transaction has been effected. *See* Pet. 7-10 (summarizing the invention). Thus, Alice's invention is not even properly characterized as a form of escrow—much less an attempt to "monopolize" the entire concept.

Indeed, CLS's faulty analysis highlights the problem with approaching section 101 by first stripping a patent claim of its actual limitations to isolate some supposed abstract idea that lies at its core: The analysis risks becoming so thoroughly divorced from the actual invention that the way the invention as a whole functions is lost altogether, and the "abstract idea" left standing when the limitations are removed may or may not have anything to do with the actual invention. That is precisely the result this Court counseled against in *Diamond v. Diehr*, when it explained that "claims *must be considered as a whole*. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis." 450 U.S. 175, 188 (1981) (emphasis added).

CLS also argues that "Alice's method claims are conceptually indistinguishable from those this Court held ineligible in *Bilski*." BIO 12. That too is incorrect. Most obviously, unlike Alice's claims, the claims in *Bilski* did not require the use of a computer at all; the patentee in *Bilski* conceded that the claims were not limited to any kind of machine in order to implement the invention. *See Bilski*, 130 S. Ct. at 3223-24; *In re Bilski*, 545 F.3d 943, 962 (Fed. Cir. 2008) (en banc). Here, by contrast, it is undisputed that Alice's invention *does* require a computer. Pet. App. 28a; *see also* BIO 13-14.[2] Similarly, to support its contention that Alice's patents concern only abstract ideas, CLS asserts that the Federal Circuit judges who referenced flowcharts and other detailed descriptions in the specifications misunderstood the patents. See Pet. App. 73a-75a (Rader, C.J.), 96a-98a (Moore, J.). According to CLS, "the flowcharts reproduced in the dissenting opinions" "do not refer to the *asserted* claims." BIO 22; see also *id.* at 5 ("[m]ost of the specification, and the great majority of the drawings relates to ... *unasserted* claims."). But CLS's assertions have no support in the record,[3] and CLS does not deny that, even as it reads the patents, they provide a wealth of detail directly pertaining to the asserted claims.

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[2] CLS blatantly misstates that Alice's expert "conceded" that "Alice's claims 'could be performed without use of a computer.'" BIO 13. In fact, however, Alice's expert opined that "[i]n an abstract sense, it is possible to perform the business methods of maintaining accounts, adjusting accounts, and providing an instruction without a computer or other hardware," but that the "*claimed* methods *must* be implemented electronically using

In addition to its meritless arguments concerning the facts, CLS also errs on the law when it conflates patent-eligibility and patentability. CLS repeatedly suggests that a decision in Alice's favor would result in the issuance of improper patents and the foreclosure of innovation. *See* BIO 19 ("every abstract idea could be patented"); *id.* at 20 ("a person could lay claim to future innovations just by recording the *idea* for such innovations in a patent application"); *id.* at 21 ("patents should protect those who contribute, not those who merely describe"). But holding that, for example, a specific, tangible machine like the system claimed in Alice's patents is *eligible* for patenting does not lead to the conclusion that the invention is entitled to patent protection. *See Bilski*, 130 S. Ct. at

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some type of computer processor and memory." JA1012–13 ¶¶ 40–41 (emphases added).

[3] CLS cites one page of Alice's en banc rehearing brief that supposedly "identified all of the drawings that pertain to the asserted claims," BIO 22 (citing Alice Supp. C.A. Br. 31)—but nothing in the cited passage suggested that it was identifying *every* relevant drawing.

3225 ("Even if an invention qualifies as a process, machine, manufacture, or composition of matter, in order to receive the Patent Act's protection the claimed invention must also satisfy" the statute's additional requirements); *see also* Pet. 5. To the contrary, the only result would be a conclusion that a patent claim that includes hardware components is sufficiently non-abstract to cross the threshold bar of section 101. Indeed, this Court has warned against the very conflation that CLS commits, explaining that "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Diehr*, 450 U.S. at 188-89.

CONCLUSION

For the foregoing reasons and those stated in the petition, the petition for a writ for certiorari should be granted.

Respectfully submitted,

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AMICUS
CURIAE
BRIEF

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AND
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No. 13-298

IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,
Respondents.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF AMICUS CURIAE ACCENTURE GLOBAL SERVICES, GMBH AND ACCENTURE LLP IN SUPPORT OF PETITIONER

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INTEREST OF AMICUS CURIAE ACCENTURE[1]

Accenture[2] is one of the world's leading management consulting, software technology services, and outsourcing organizations, serving 89 of the Fortune Global 100 and more than three-quarters of the Fortune Global 500. Accenture's patent no. 7,013,284 ("the '284 patent") is the subject of the recently decided Federal Circuit appeal in *Accenture Global Services, GmbH v. Guidewire Software, Inc.*, ___ F.3d ___, 2013 WL 4749919 (Fed. Cir. Sept. 5, 2013), regarding the patent eligibility of computer inventions.

Outside of any impact on the *Accenture v. Guidewire* appeal, Accenture has no stake in the outcome of this case, other than its desire for a correct and clear interpretation and application of the United States Patent Laws.

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[1] Counsel of record for all parties received notice of amicus Accenture's intention to file this brief at least 10 days prior to the due date. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No one other than Accenture made a monetary contribution to the preparation or submission of this brief. Both parties have granted blanket consent to the filing of amicus briefs.

[2] "Accenture" refers to Accenture LLP, an Illinois limited liability partnership, doing business on behalf of Accenture within the United States, and Accenture Global Services GmbH, a Switzerland limited liability company, registered owner of many of Accenture's U.S. patents.

SUMMARY OF THE ARGUMENT

The two irreconcilable decisions by the Federal Circuit since *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc) show the court's ongoing fracturing over the patent eligibility of computer inventions. The Federal Circuit's divided opinion in *Accenture*, 2013 WL 4749919 squarely conflicts with the court's other post-*CLS Bank* decision involving patent eligibility of computer inventions, *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013), petition for cert. filed, No. 13-255 (Aug. 23, 2013). Innovators and patent owners are left guessing at the proper standard for patent eligibility of computer inventions in the wake of these recent Federal Circuit decisions.

The Alice Corp. petition for certiorari offers this Court the opportunity to resolve this conflict and reaffirm its precedent holding that claims performed by a computer running a program are eligible for patenting under § 101. *Diamond v. Diehr*, 450 U.S. 175, 187 (1981). Without this Court's intervention, the tumult in the law will continue to cast uncertainty on issued U.S. patents like Accenture's with claims to computer systems operating specialized software.

The inventors of the '284 patent at issue in *Accenture* are software developers who made the patented invention while creating Accenture's Claims Center software, a product that analysts have rated as the best in the business of computerized insurance claim processing. Despite acknowledging that the '284 patent claims a computer system with multiple databases and software components, a divided panel of the Federal Circuit held that the claims cover only the abstract concept of "generating tasks [based on] rules . . . to be completed upon the occurrence of an event" and are therefore ineligible for patenting under 35 U.S.C. § 101. *Accenture* at *8. Chief Judge Rader dissented, arguing that the claimed computer systems present patent-eligible subject matter requiring a "specific combination of computer components," which the majority improperly stripped away in reaching its conclusion. *Id.* at *11-12 (Rader, C.J., dissenting). The dissenting opinion also objected to the § 101 analysis applied by the majority and disputed the precedential effect and proper interpretation of the fractured *en banc* decision in *CLS Bank. Id.*

The petition should be granted to resolve the conflict at the Federal Circuit over the patentability of computer-related inventions illustrated in *CLS Bank*'s fractured opinions and the subsequent conflicting decisions in *Ultramercial* and *Accenture*.

ARGUMENT

I. The petition should be granted to resolve the questions left unanswered by the *en banc* Federal Circuit in the fragmented decision below.

Recognizing the uncertainty that has developed on the proper standard for evaluating computer inventions under 35 U.S.C. § 101, the Federal Circuit reheard *CLS Bank en banc.* But instead of "ameliorat[ing] this uncertainty by providing objective standards for section 101 patent-eligibility," the court "propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation." Pet. App. 100a (Newman, J. dissenting).

The questions posed by the court below—when a computer in a claim imparts patent eligibility and what test should be used to determine eligibility of a computer-implemented invention—remain unanswered. *See* Pet. App. 240a. Inventors and patent owners need resolution of these questions to avoid uncertainty as to whether their innovations are patent eligible. The petition should be granted so that this Court can provide the answers that the Federal Circuit could not.

II. This Court's intervention is needed now because the Federal Circuit's decisions since *CLS Bank* show that it has gotten no closer to providing the guidance needed by inventors and patent owners.

Since *CLS Bank*, the Federal Circuit has decided two appeals involving the patent eligibility of computer inventions, resulting in irreconcilable panel decisions that show ongoing conflict. In *Ultramercial v. Hulu*, the court ruled patent eligible an invention for monetizing the distribution of copyrighted materials over the Internet, explaining that the detailed patent specification, the programming complexity of the invention, and the specific steps of the claims "meaningfully limit[ed] 'the abstract idea at the core' of the claims." 722 F.3d 1335, 1352-53 (Fed. Cir. 2013). The court found in particular that a computer programmed with software became a patentable "new" or "particular" machine. *Id.* at 1353.

In contrast, in *Accenture v. Guidewire*, a divided Federal Circuit panel found computer systems and software for processing insurance claims ineligible for patenting, 2013 WL 4749919, *8, dismissing the complex computer programming in the specification, *id.* at *9, and characterizing claim limitations including two databases, client and server components, and an event processor as nothing more than "generalized software components," *id.* at *8. The court thus equated the claimed invention to an abstract idea of "generating tasks [based on] rules . . . to be completed upon the occurrence of an event." *Id.* at *8.

In their conflicting holdings and in many other ways, the Federal Circuit's opinions have increased uncertainty for inventors and patent owners. The court in both *Accenture* and *Ultramercial* had a minority opinion disputing the § 101 analysis applied by the majority. *Ultramercial*, 722 F.3d at 1354 (Lourie, J., concurring) ("I concur in the result reached by the majority, but I write separately because I believe we should concisely and faithfully follow the Supreme Court's most recent guidance . . . rather than to set forth our own independent views, however valid we may consider them to be."); *Accenture*, 2013 WL 4749919, *10 (Rader, C.J., dissenting) ("'A court cannot go hunting for abstractions by ignoring the concrete, palpable, tangible limitations of the invention the patentee actually claims.' In my judgment, the court has done precisely that. Therefore, I respectfully dissent.") (quoting *Ultramercial*, 722 F.3d at 1344).

The Federal Circuit's recent decisions also conflict on whether the five-judge opinion in *CLS Bank* should be followed. *Accenture*, 2013 WL 4749919, *10 (Rader, C.J., dissenting) ("[T]he court relies significantly on the framework proposed by the plurality opinion in *CLS Bank*. However, no part of *CLS Bank*, including the plurality opinion, caries the weight of precedent."); *Ultramercial*, 722 F.3d at 1354 (Lourie, J., concurring) ("[W]e . . . should track the plurality opinion of five judges from this court in *CLS Bank*.") The opinions reveal disagreement over what other conclusions can be drawn from *CLS Bank*, if any. *See, e.g., Accenture*, 2013 WL 4749919, *4 ("Although CLS Bank issued as a plurality opinion, in that case a majority of the court held that system claims that closely track method claims and are grounded by the same meaningful limitations will generally rise and fall together."); *id.* at *11 (Rader, C.J., dissenting) ("[F]our judges specifically held that '[d]ifferent claims will have different limitations; each must be considered as written.' This latter view was recently affirmed by the court: 'the question of eligible subject matter must be determined on a claim-by-claim basis.' *Ultramercial*, 722 F.3d at 1340.").

The *Accenture* and *Ultramercial* decisions also diverge on the treatment of specific computer limitations in patent claims supported by a detailed specification, with *Accenture* dismissing the limitations and specification out of hand, and *Ultramercial* relying significantly on each to impart patentability. It is undisputed that the patents in both cases claim computers and computer technology. *Ultramercial*, 722 F.3d at 1350 ("By its terms, the claimed invention invokes computers and applications of computer technology."); *Accenture*, 2013 WL 4749919, *1 ("[T]he claimed system includes an insurance transaction database, a task library database, a client component for accessing the insurance transaction database, and a server component that interacts with the software components and controls an event processor . . . ."). The court in each case acknowledged that the patent specifications confirm computer implementation. *Ultramercial*, 722 F.3d at 1350-51 ("Figure 1, alone, demonstrates that the claim is not to some disembodied abstract idea but is instead a specific application of a method implemented by several computer systems . . . ."); *Accenture*, 2013 WL 4749919, *1 ("The specification contains detailed descriptions of various software components, including many of the functions those components utilize and how those components interact.") Yet the court reached different conclusions on the impact of the claimed computer-elements on patent eligibility. *Ultramercial*, 722 F.3d at 1353 ("[T]he broadly claimed method in the '545 patent does not specify a particular mechanism for delivering media content to the consumer [but] this breadth and lack of specificity does not render the claimed subject matter impermissibly abstract."); *Accenture*, 2013 WL 4749919 *9 ("Although the specification of the '284 patent contains very detailed software implementation guidelines, the system claims themselves only contain generalized software components arranged to implement an abstract concept on a computer.").

The many conflicts between the Federal Circuit's decisions in *Accenture* and *Ultramercial* show that *CLS Bank* did not provide the needed guidance but rather created more uncertainty by adding disputes over the meaning of the various opinions in *CLS Bank*. These decisions also bear out the concern that, after *CLS Bank*, patentability of computer inventions will "depend on the random selection of the panel." Pet. App. 100a (Newman, J., dissenting); *see* Alice Corp. Cert. Petition, p. 3 (expressing concern that the scope of patent protection for computer inventions remains "utterly panel dependent"). In light of the ongoing conflict in the Federal Circuit's treatment of computer inventions under § 101, this Court's intervention is needed now.

III. The irreconcilable fracturing of the Federal Circuit over the issue of patent eligibility of computer inventions threatens patented products made by innovative companies like Accenture.

The fate of Accenture's '284 patent illustrates the danger of the current state of the law on § 101 to innovative software companies. The patent invalidated by a divided panel in the wake of the conflicted *CLS Bank* case was invented by Accenture software designers who created an important software product that has been ranked as the best in the field. This Court should grant the petition to ensure that inventions like Accenture's are encouraged and protected, not invalidated by happenstance.

The patent at issue in *Accenture* covers the Accenture Claim Components Solution software. *Accenture Global Services, GmbH v. Guidewire Software, Inc.*, 800 F. Supp. 2d 613, 615-16 (D. Del. 2011). The dispute between Accenture and Guidewire, competitors in the field of computer-based claims processing systems, involves Guidewire's competing software product, Guidewire ClaimCenter. *Id.*

Accenture's patent describes a "computer program . . . for handling insurance-related tasks" using multiple software components. *Accenture Global Services, GmbH v. Guidewire Software, Inc.*, 2013 WL 4749919, *1-2 (Fed. Cir. Sept. 5, 2013). The specification "contains detailed descriptions of the various software components including many of the functions those components utilize and how those components interact." *Id.* Computer scientists testified that the '284 patent claims describe a specific, component-based architecture, machine, and operation and noted that the claims reference specific hardware components and call on these components, through software, to perform transformations of data and conduct interaction with insurance claims handlers.

The patented product, Accenture's Claim Components Solution software, was rated among the best in its field, with industry reports specifically citing the patent as one of its strengths. This Court has recognized the importance of such "Information Age" innovations, noting that "times change" and "Section 101's terms suggest that new technologies may call for new inquiries." *Bilski*, 130 S. Ct. at 3227-28.

Nonetheless, two judges on the Federal Circuit held that the computer system and software claimed in the '284 patent is unpatentable because it preempts the abstract concept of "generating tasks [based on] rules . . . to be completed upon the occurrence of an event." *Accenture* at *8. In a dissenting opinion, Chief Judge Rader disagreed, disputing the majority's reliance on a nonprecedential opinion from *CLS Bank* and maintaining that the claimed computer systems present patent-eligible subject matter requiring a "specific combination of computer components" that the majority improperly stripped away in reaching its conclusion. *Id.* at *11-12. Caught in the midst of this ongoing disagreement at the Federal Circuit, Accenture's patent has been invalidated.

The impasse over § 101 at the Federal Circuit has created an intolerable environment for inventors and innovative companies developing new computer systems and software. This Court's intervention is urgently needed to protect these innovators and preserve the Constitutional goal of the patent system to "promote progress [in] the useful arts." U.S. Const. art. I, § 8.

IV. If this Court does not intervene, thousands of issued software patents will be called into question.

Undisputed evidence showed that Accenture's '284 patent is typical of software patents owned by other innovative companies like IBM and Microsoft. In the last fifteen years, computing technology and software have become central to the U.S. economy and innovators have protected their creations with patents. The number of software patents increased nearly 100-fold, with tens of thousands of patents issued for software inventions. Ann M. McCrackin, *Trends in Software and Business Method Patents*, in Electronic and Software Patents: Law and Practice, § 1.03 (2d ed., 2009 Supp.). If this Court does not intervene, these patents will be threatened with invalidation under the conflicting and uncertain results in *CLS Bank* and the ensuing decisions from the Federal Circuit.

This Court has warned that "courts must be cautious before adopting changes that disrupt the settled expectations of the inventing community." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 739 (2002) (citing *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 28 (1997)). This Court should therefore intervene because "[t]o change so substantially the rules of the game now could very well subvert the various balances the PTO sought to strike when issuing the numerous patents which have not yet expired and which would be affected by [the Court's] decision." 535 U.S. at 739 (quoting *Warner-Jenkinson*, 520 U.S. at 32 n.6).

Indeed, this Court has explained that "fundamental alterations" to settled rules of patentability that "risk destroying the legitimate expectations of inventors" are the responsibility of Congress, not the courts. *Id.*

Grant of the petition would prevent the Federal Circuit from fundamentally reworking the law of software patent eligibility. A change of this magnitude should not be enacted by divided panels and disputed application of plurality opinions.

V. This Court should grant the petition to reaffirm its holding in *Diehr* that computers running software programs are eligible for patenting under § 101.

The petition presents the opportunity to restore certainty and return to the first principles of the plain statutory language and this Court's precedent. Nearly thirty-five years ago, this Court explained that "[i]t is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Diehr*, 450 U.S. at 187. This Court's earlier cases, *Benson* and *Flook*, "lend support to our present conclusion that a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer." *Diehr*, 450 U.S. at 187. Following *Diehr*'s guidance, Justice Kennedy noted more recently that "[t]echnology and other innovations progress in unexpected ways," and cited computer programs as an example of patentable inventions that were once thought, wrongly, to be excluded from patenting. *Bilski*, 130 S. Ct. at 3227.

In *Diehr*, the Court reversed the Patent Office's rejection of claims to a computer-implemented program for curing rubber, noting the Office's mistaken belief that "claims that are carried out by a computer under control of a stored program constituted nonstatutory subject matter under this Court's decision in *Gottschalk v. Benson*." *Diehr*, 450 U.S. at 180. Instead, the Court explained, "a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer." *Id.* at 187. A computer-implemented invention including an abstract idea such as a mathematical formula or algorithm is eligible for patenting so long as the claim, taken as a whole, represents "an application of a law of nature or mathematical formula." *Diehr*, 450 U.S. at 187. Indeed, the Supreme Court has characterized the patenting of claims that apply mathematical formulas as "commonplace." *Id.*

The Supreme Court should reaffirm these principles and restore the broad scope Congress intended for the law of patent eligibility under § 101. "Any" processes or machines are patent eligible under § 101, subject only to a few specific exceptions. *Bilski*, 130 S.Ct. at 3225. "[A]ll inventions at some level embody . . . [an] abstract idea[]." *Mayo Collaborative Services v. Prometheus Labs.*, 132 S. Ct. 1289, 1293 (2012). The question is whether the idea is practically applied. *Diehr*, 450 U.S. at 187. As the '284 patent claims in *Accenture* demonstrate, a computer running specific software components is a patentable application and not an abstract idea, assuming it meets the other, more stringent, requirements of patentability.

CONCLUSION

The petition should be granted to resolve the conflict at the Federal Circuit over the patentability of computer-related inventions.

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QUESTION PRESENTED

Alice asks "whether ... computer-implemented ... machines, processes ... are ... patentable ... subject matter within the meaning of 35 U.S.C. § 101 ...?" The more fundamental question is: "where are industries to turn in the absence of patent protection for such technologies since patent law, not copyright law, protects the functional (valuable) machines or processes specified by computer programs?" Also, *Markman v. Westview Instruments*, 517 U.S. 370 (1996) states a "patent is a legal instrument, to be construed, like other legal instruments," yet 245 legal claims in Alice's legal instruments (39 claims in US Patent 5,970,479; 75 claims in US Patent 6,912,510; 84 claims in US Patent 7,149,720; and 47 claims in US Patent 7,725,375) stand unconstrued yet threatened for allegedly reading on a human mind thinking, yet one skilled in the art would NEVER construe the claims as human thinking because Intelligence Amplification automation, like Alice's, is sold to augment humans, not replace them. Humans are the market to whom Alice sells. A bizarre result reached because Alice's claims have never been construed in accordance with *Markman*. *Is this fair?* Further, the court below created (2008) an alleged "machine or transformation test" from a hodge-podge of this Court's Industrial Age law (CAFCIndustrialAge Test) that gives the drafting attorney the Hobson's choice of (a) drafting claims that pass the CAFCIndustrialAge Test, but are subject to strong legal arguments of invalidity and/or unenforceability as a matter of law, or (b) drafting claims that are enforceable and valid, but subject to strong legal arguments that such claims fail the CAFCIndustrialAge Test. Is this right? For these reasons, Amicus asks this Court to grant Alice's Petition.

PARTIES TO THE PROCEEDING

All parties to the proceeding are identified in the caption.

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INTEREST OF *AMICUS CURIAE* [1]

Dale Cook, Pro Se Amicus, the real party in interest, is an attorney licensed by Texas (1992) and Washington (2001). Mr. Cook believes "V for Vendetta" frames showing non-copyrightable material is fair use, but is seeking permission.

Mr. Cook filed a Pro Se Amicus brief in the court below.

SUMMARY OF ARGUMENT

Patent, not Copyright, protects the machines and processes specified by computer programs. Court should require *Markman*-compliant claim construction in all patent litigations that involve Intelligence Amplification (IA) automation, especially where malpractice is implicated.

IA automation is a type of technology that varies machine states to produce "data" (human perceivable differences) that can be understood as "information" (human understandable "data") by/with human thinking. One skilled in the art would NEVER construe process claims to IA machine-state-produced data as human thinking.

The CAFCIndustrialAge Test applied to IA technologies creates a DILEMMA: patentable subject matter that meets the Test but easily argued invalid/unenforceable "as a matter of law" or vice versa.

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[1] No counsel for a party authored this brief in whole or in part, and no party or counsel for a party made a monetary contribution intended to fund the preparation or submission of this brief. No one other than *amicus curiae*, its members, or its counsel made a monetary contribution to the preparation or submission of this brief. *Amicus* understands from the SCT website that all parties have consented to *Amicus* briefs.

The conclusion that Alice is patent-claiming "human thinking" can be cured by adherence to *Markman*. But, this Court must resolve the DILEMMA created by CAFCIndustrialAge Test.

ARGUMENT

I. Intelligence Amplification Technologies, Such as Described in the Question Presented, Cannot be Discussed Without the Benefit of a Precise Formal Vocabulary that Distinguishes Between (a) Processes-Emergent-From-Program-Assembled-Machines-In-Operation, and (b) Program-Assembled-Machines-Proper, and (c) Machine States, and (d) Data (human-perceivable differences), and (e) Information (human understandable Data); In the Face of this Complexity, Markman-Compliant Claim Construction Should be Required

Attorney malpractice is a State Law cause of action and State Courts must follow Federal substantive patent law. *Gunn v. Minton*, 568 U.S. __ (2013). This Court states a "patent is a legal instrument, to be construed, like other legal instruments ... by the standard construction rule that a term can be defined only in a way that comports with the instrument as a whole ... the decision maker vested with the task of construing the patent ... to ascertain whether an expert's proposed definition fully comports with the specification and claims and so will preserve the patent's internal coherence." *Markman v. Westview Instruments*, 517 U.S. 370 (1996). Yet the 245 legal claims (39 claims – Patent 5,970,479; 75 claims – Patent 6,912,510; 84 claims – Patent 7,149,720; and 47 claims Patent 7,725,375) in Alice's ambiguously "invalidated" legal instruments have never been construed in accordance with *Markman*. *CLS Bank v. Alice*, 717 F.3d 1269 (Fed. Cir. 2013). Is this fair?

One skilled in the art would NEVER construe the claims as human thinking because Intelligence Amplification automation, like Alice's, is sold to augment humans, not replace them. Humans are the market to whom Alice sells. Alice does not sell human thinking, but rather a change in machine states/ processes, and thus one skilled in the art could never derive human thinking from the claims. That is why this Court's *Markman* jurisprudence is so critical.

There are no words in this Court's jurisprudence that accurately address the concepts of Intelligence Amplification ("IA") automation such as Alice's. Like Heidegger's English translators, Amicus creates and uses compound words herein. The compound words are meant to assist the Court in remembering that, in IA automation, (i) one part of a computer program assembles a machine, (ii) another part of the computer program specifies how that machine will operate, (iii) when that program-assembled machine is in operation, another part of the computer program causes the states of various of the machine parts (mechanical) or voltage (electronic) to be mapped/ recorded, and (iv) those dynamically mapped/recorded states typically constitute data that IA process claims are drafted toward. So, a claimed IA process does typically emerge from the operations of a program-controlled machine, where that machine itself was previously assembled by the computer program.

Either the emergent process or the machine itself is typically claimed in IA.

To help the Court from being confused in the face of this complexity, Amicus creates and uses herein this FIRST COMPOUND WORD: "processes-emergent-from-program-assembled-machines-in-operation-OR-program-assembled-machines-proper"; this SECOND COMPOUND WORD: "processes-emergent-from-program-assembled-machines-in-operation"; and this THIRD COMPOUND WORD: "program-assembled-machines-proper."

Processes-emergent-with-program-assembled-machines-in-operation (process statutory class) claim construction can be complicated in that the machines are assembled from selected logic circuits by computer programs, and then the processes emerge from the mapped states of such computer-program-assembled machines-in operation, or at ending state. If viewed from "inside" the machine (e.g., on the inside of an LCD monitor – the part a human can't see), the changes of states of the machine are just that: changes in state (e.g., changes in voltage signals that drive associated brightnesses of pixels on a computer screen). However, when the changes in machine states create a difference a human can perceive, formally "data" (plural of datum) are produced (e.g., the different voltages are such that a human can perceive differences in brightness in at least two areas of the screen). For example, if the changing voltages drove pixel brightness differences creating a character string that an observing human could discern – such as "comprar el dólar canadiense inmediatamente por 90 centavos de dólar en la que tenemos un comprador dispuesto a pagar inmediatamente 95 centavos de dólar" – such a string would constitute data. If a human observer only understands English and not Spanish, such a string would merely constitute data.

However, if data – human-discernible differences (e.g., text string) – are understood to have a meaning by an observing human, such data are said to formally constitute "information." For example, if the data (machines states (e.g., varying voltages/varying pixel brightnesses)) formed the character string "buy the Canadian dollar immediately for 90 cents US in that we have a buyer willing to immediately pay 95 cents US"[2] the data – character string – would constitute information for an English reader.

That character string (data) can be understood by/with human thought, but the data itself does not constitute human thought. From the machine standpoint, it is just the current state of a process that changes pixel brightnesses as dictated by the computer program.

A patent claim to that process would read like the string ("buy the Canadian dollar immediately …), but with a proper claim construction, one skilled in the art would understand that what was claimed was the machine-in-motion – process – or an end state of a process that resulted in pixel brightnesses that a viewing human could perceive as the string "buy the Canadian dollar immediately…." One skilled in the art would not construe the claim as human thinking because Intelligence Amplification automation, like Alice's, is sold to augment humans, not replace them. Humans are the market to whom Alice sells. Alice does not sell human thinking, but rather a change in machine states/processes, and thus one skilled in the art could never derive human thinking from the claims. That is why this Court's *Markman* jurisprudence is so critical here.

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[2] From "Google Translate."

The Court should require *Markman*-compliant claim construction ("*Markman*") in all patent litigations to avoid courts being misled as they have been in Alice's cause.

II. Where Are Intelligence Amplification Technologies Industries to Turn in the Absence of Patent Protection for the Machines and Processes Specified by Computer Programs (a form of hardware specifications)

Alice asks "whether … computer-implemented … machines, processes … are ... patentable … subject matter within the meaning of 35 U.S.C. § 101 …?" The more fundamental question is: "where are industries to turn in the absence of patent protection for such technologies since patent law, not copyright law, protects the functional (valuable) machines or processes specified by computer programs?" Further, the court below created an alleged "machine or transformation test" from a hodge-podge of this Court's Industrial Age law (CAFCIndustrialAge Test), *Bilski*, 545 F.3d 943 (Fed. Cir. 2008), that gives the drafting attorney the Hobson's choice of (a) drafting claims that pass the CAFCIndustrialAge Test, but subject to strong legal arguments that such claims are invalid and/or unenforceable as a matter of law, or (b) drafting claims that are enforceable and valid, but subject to strong legal arguments that such claims fail the CAFCIndustrialAge Test. Is this right?

The accused infringer (CLS Bank) is an institution of significant financial means. The owner of the patent rights (Alice, who is not the inventor) is desirous of at least part of those means as compensation for the patent rights it believes it owns. The owner of such patent rights will be disappointed should it turn out that the legal instruments are drafted to unpatentable subject matter. The implications are staggering, and improper, the results of brilliant lawyering as befit the financial industry, but improper nevertheless.

Malpractice liability can only be established if harm is proven. Alice's harm – the loss of all patent infringement rights – is enormous and will affect all industries relying on legal protection for processes-emergent-from-program-assembled-machines-in-operation-OR-program-assembled-machines-proper.

This Court, in light of its pronouncements in *Gunn* that State Courts will follow the substantive patent law as set forth by the Federal Courts, should ensure that the substantive patent law is objective, so the State Courts can follow *Gunn*. *Markman* should be required, and the law applied here should be clear enough that a State Court could apply the same law to reach substantially the same result should a malpractice claim be made.

The judge-created exceptions to otherwise statutory subject matter are not consistent with this goal. Analytically, the judge-created exceptions to otherwise patentable statutory subject lie where an attorney, following their ethical rules, would likely not reach in view of his client duties and the law. An implication of loss of all client rights/attorney error for not knowing a shifting and uncertain "standard" – upon which no judges/Justices can agree – buried levels deep under ethically-driven attorney reliance is not in accord with an attorney's ethical duties to his client, and exposes the drafting attorney to the liability theory used in the record setting $72.6 million Akin Gump patent attorney malpractice verdict. The Court should strike all judge-created exceptions from the law in favor of other more fair and objective criteria (such as novelty) on at least this basis, but especially in view of *Gunn*.

Alice's legal instruments reach this Court with some judges stating that the statutory class to which the claims are drafted may not matter. This is inconsistent with this Court's understanding in *Markman*: the substantive law of post-issuance patent claim infringement varies dependent upon the statutory class under consideration.

For IA technologies, a claim to a machine activates different infringement law and has different enforcement considerations than a claim to a process. Attorneys often choose the statutory class as a legal strategy in view of the expressed commercial objectives of their clients and in view of their fiduciary and ethical duties. The statutory class of the claim is crucial and cannot be ignored.

Patent claims must be sufficiently definite to provide notice to others that the patent owner is claiming a right to exclude through the vehicle of patent infringement lawsuits. Notice for IA technologies is complicated due to the ease with which the technology allows nouns (machines) to be mischaracterized as verbs (process). Failure to keep nouns and verbs straight subjects the client to strong/expensive post-issuance argument that such claims are invalid as a matter of law.

Enforcement for IA Technologies is complicated due to the ease with which such technologies can be "parted up." For example, drafting attorneys must foresee a company placing different parts of its automation in different legal sovereigns to avoid patent infringement claims (e.g., where the United States has no legal jurisdiction (e.g., Canada)). Failure to take account of the multi-sovereign gambit subjects the client to strong/expensive post-issuance argument that such claims are unenforceable as a matter of law.

Before 2008, it was possible to draft pure system or pure method claims that would meet the definiteness requirements and tend to forestall the multi-sovereign gambit. Attorneys could draft around the noted complexities by patterning on CAFC precedent.

However, the CAFC recently replaced time-tested IA technology law with a "machine or transformation test" cobbled together from a hodge-podge of this Court's Industrial Age law ("CAFCIndustrialAge Test"). *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008). This hodge-podge creates a DILEMMA: (a) drafting claims that meet the CAFCIndustrialAge Test, but are subject to strong/expensive arguments of invalidity/unenforceability as a matter of law, or (b) drafting claims that are enforceable/valid, but subject to strong/expensive arguments that such claims are unpatentable for failing to meet the CAFCIndustrialAge Test. The Court should grant Alice's petition to address and resolve this dilemma.

In view of lack of copyright protection, *Gunn*, and the irresolvable legal dilemmas that arise from the application of the CAFCIndustrialAge Test to IA technologies, this Court should, (a) require a *Markman* where a client could reasonably conclude legal malpractice is implicated, with careful account of the statutory subject matter class to which the attorney drafted the claim, (b) eliminate all judge-created exceptions to the patent statutes in favor of objective criteria consistent with attorney rules/duties which State Courts can apply in attorney malpractice actions, and (c) resolve the dilemma created by applying the CAFCIndustrialAge Test to Information Age technologies.

III. Copyright (95 years) Does Not Protect the Functional or Efficiency-Driven Parts of Computer Programs (Machines or Processes), Which When Properly Understood Are the Domain of Patent (20 years)

Amicus directly quotes the trial judge in the ongoing saga of Oracle versus Google:

> This action was the first of the so-called "smartphone war" cases tried to a jury. This order includes the findings of fact and conclusions of law on a central question ... extent to which, if at all, certain replicated elements of the structure, sequence and organization of the Java application programming interface are protected by copyright.
>
> . . .
>
> 2. The Development Of Law On The Copyrightability Of Computer Programs And Their Structure, Sequence And Organization
>
> . . .
>
> Turning now to the more difficult question, this trial showcases a distinction between copyright protection and patent protection ... question ... arises whether the copyright holder is more appropriately asserting an exclusive right to a functional system, process, or method of operation

> that belongs in the realm of patents, not copyrights.
>
> ...
>
> [Summary: Supreme Court, 1976 amendments to 17 U.S.C. 102(b) of the copyright statutes, the 2nd (1992), 9th (1992), 10th (1993), 1st (1995), CAFC (2007) hold that machines/processes of computer programs are patent, not copyright:]
>
> ...
>
> ... Oracle's evidence ... show that the design of methods in an API was a creative endeavor. ... such inventions – at the concept and functionality level – are protectable only under the Patent Act. The Patent and Trademark Office examines such inventions for validity and if the patent is allowed, it lasts for twenty years. Based on a single implementation, Oracle would bypass this entire patent scheme and claim ownership over any and all ways to carry out methods for 95 years – without any vetting by the Copyright Office of the type required for patents....

Oracle Am., Inc. v. Google Inc., 872 F. Supp. 2d 974 (D. Cal. 2012).

IV. Markman Should be Required – The Courts Have Been Misled: Alice's Processes Are Not the Human Mind; the Voltage and Timing Signals of Processors – Expressed in Binary Form (e.g., 11001001) – Are Not the Human Mind Performing Binary Arithmetic With Pen and Paper

CLS Bank's presence at this Court shows the technology underlying Alice's legal instruments is used for commerce, not philosophy. The CAFC has been misled by argument surrounding the term "computer implemented methods." Amicus seeks to undo this by demonstrating Alice's claimed computational processes emerge from/with special purpose machines that are assembled and interoperated by the complex technical specifications referred to as computer programs. Amicus seeks to do this through the use of an analogy to domino patterns that has been approved as an analogy by various technical experts. The following is an analogy, believed to be an illuminating one for the Court.

A computer program can be superficially confusing because what it actually comprises has been glossed over as the power of technology has allowed computer programmers to move further and further away from the machines that their programs actually assemble and control. When properly understood, a computer program is anything but abstract.

A computer program for a general purpose processor specifies:[3] (a) a selection drawn from a collection of many available computing elements in the general purpose processor, analogous to the way that a human could select dominoes from a box of red and black dominos (e.g., red like "logical 1"; black like "logical 0"); (b) a specification of how the selected computing elements are to be (i) organized (e.g., in sequence or in parallel) to "set up" desired combinational, sequential, and/or parallel logic circuit(s), analogous to the way the human might arrange the black-and red dominoes on a floor and (ii) such organization further including the sequences and timing of the voltage levels that will be applied to the various selected computing elements in the "set up" circuit(s), analogous to the way that a human would space and arrange the red and black dominoes such that if they fell into each other the resultant of the various domino interactions as they fell into each other would form a desired dynamic pattern in the dominoes; (c) an initiation signal that kicks the logic circuit(s) into action, analogous to the way a human kicks his domino chain into action by "flicking" the first domino; such that (d) after initiation, the states of the various program-selected, program-arranged, and program-timed computing elements as they interoperate in the manner specified by the computer program may be observed/recorded/mapped, analogous to the way that dominoes, when properly set up and sequenced, flow in/form a human-desired red-black pattern/process that can be photographed until, (e) ultimately, the flowing pattern/process generated by the interoperating computing circuits gives the result of a set of determined and discrete machine states which manifest a human-perceivable pattern that confers meaning to an observing human, which is analogous to the result of a set of determined and discrete black-and red domino states which manifest a human-perceivable pattern that confers meaning to an observing human when everything in the domino setup works properly.

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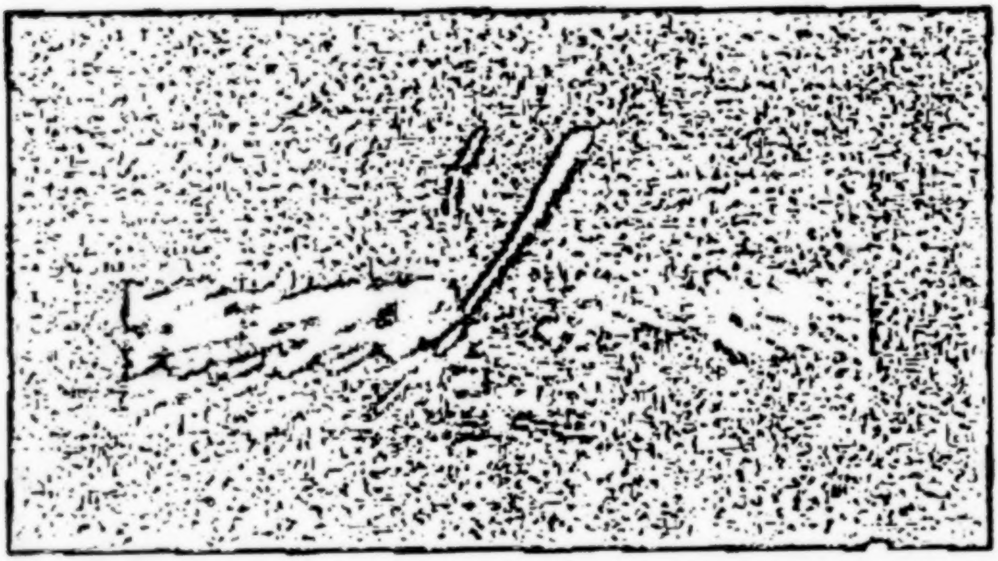
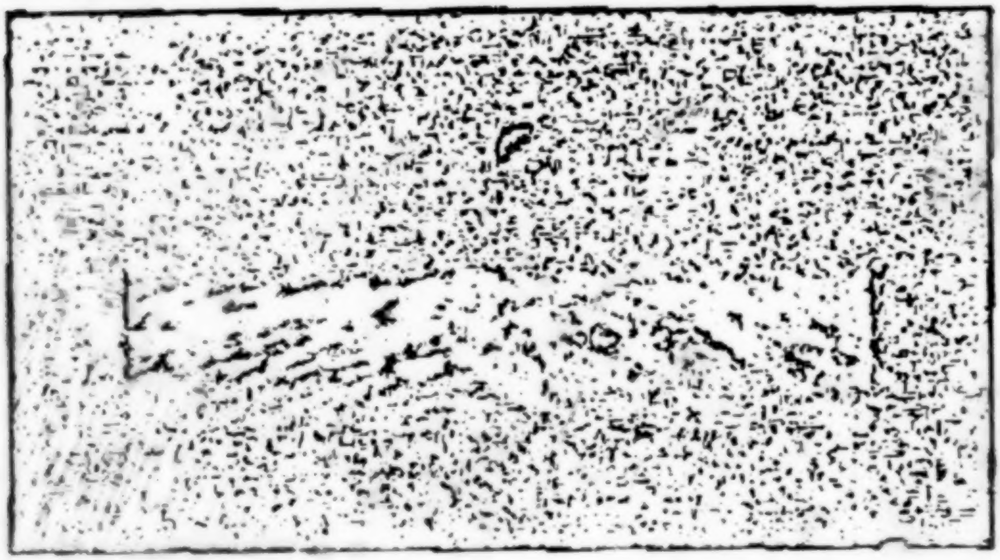
[3] Human readable source code is compiled (e.g., "translated") into the machine code appropriate to the Instruction Set Architecture of the general purpose processor upon which it will run. At a gross level, the translated human readable source code assembles, operates, and tears down the machines as described. Billions of minute operations are involved in what is here described at a gross level, but that does not make what is deterministic and tightly controlled abstract.

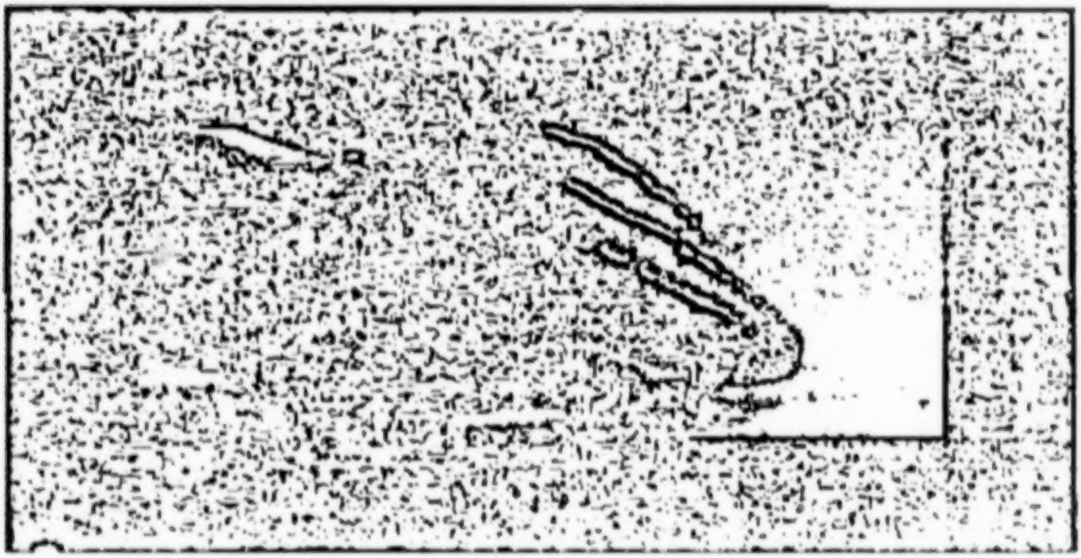
Now Amicus presents the emergent process domino analogy in pictures. A computer program for a general purpose processor specifies:

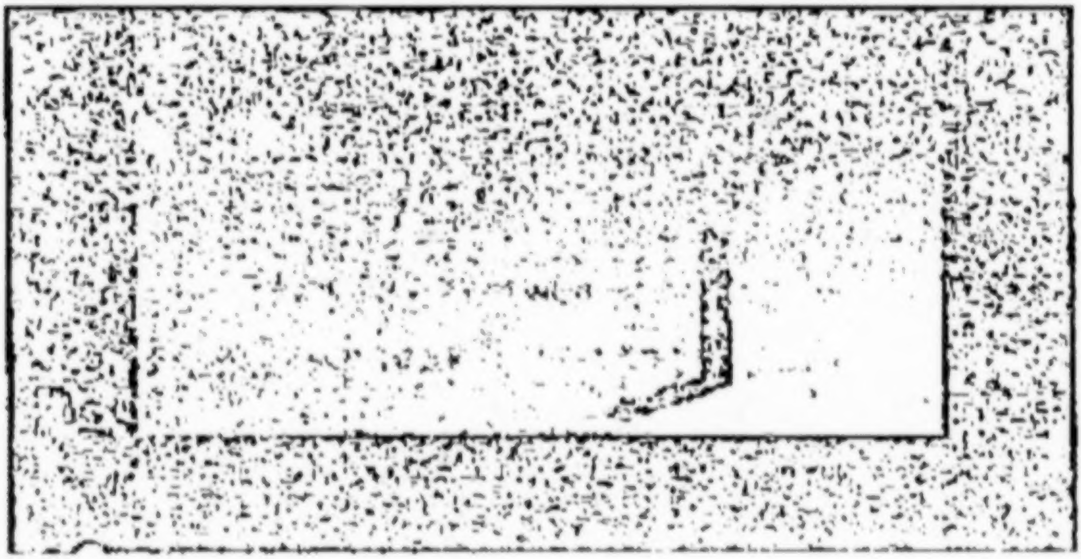
(a) a selection drawn from a collection of many available computing elements in the general purpose processor, analogous to ...;

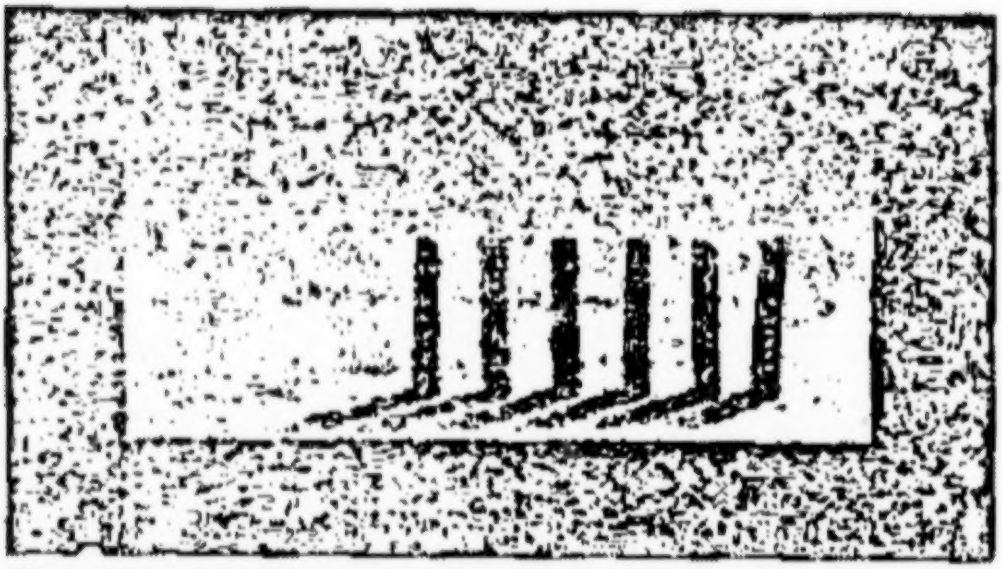


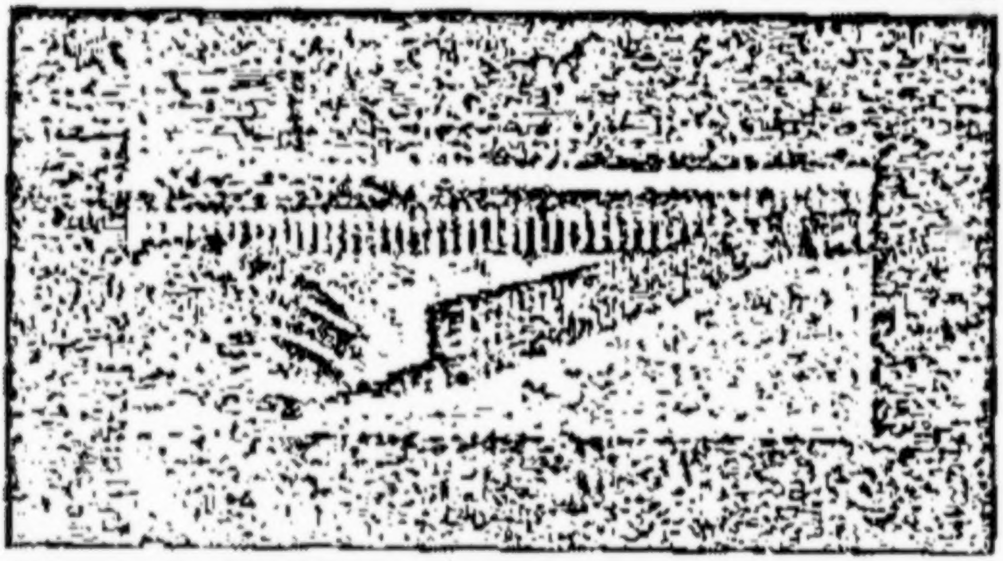


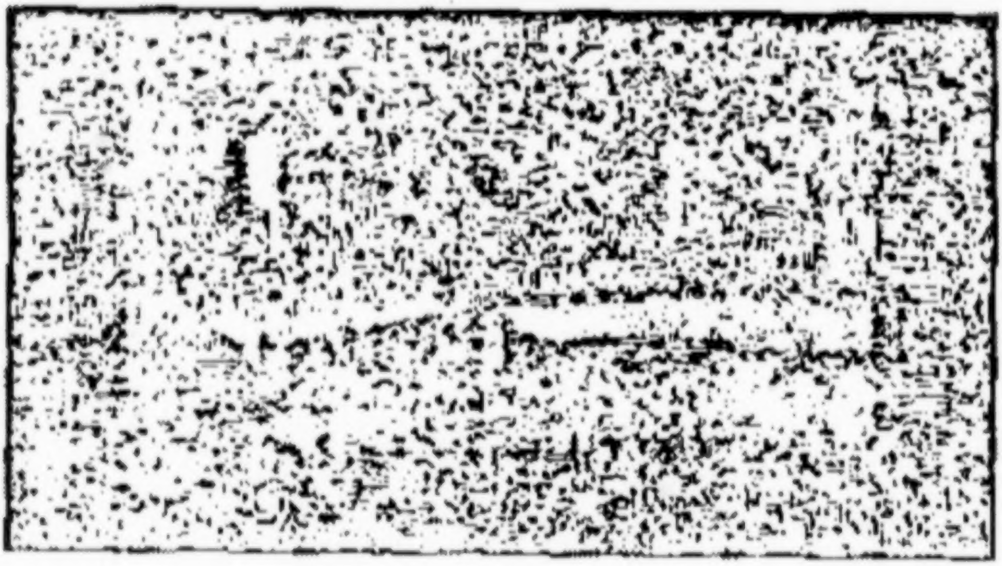
(b) a specification of how the selected computing elements are to be (i) organized (e.g., in sequence or in parallel) to "set up" desired combinational, sequential, and/or parallel logic circuit(s), analogous to ... and (ii) such organization further including the sequences and timing of the voltage levels that will be applied to the various selected computing elements in the "set up" circuit(s), analogous to ...;











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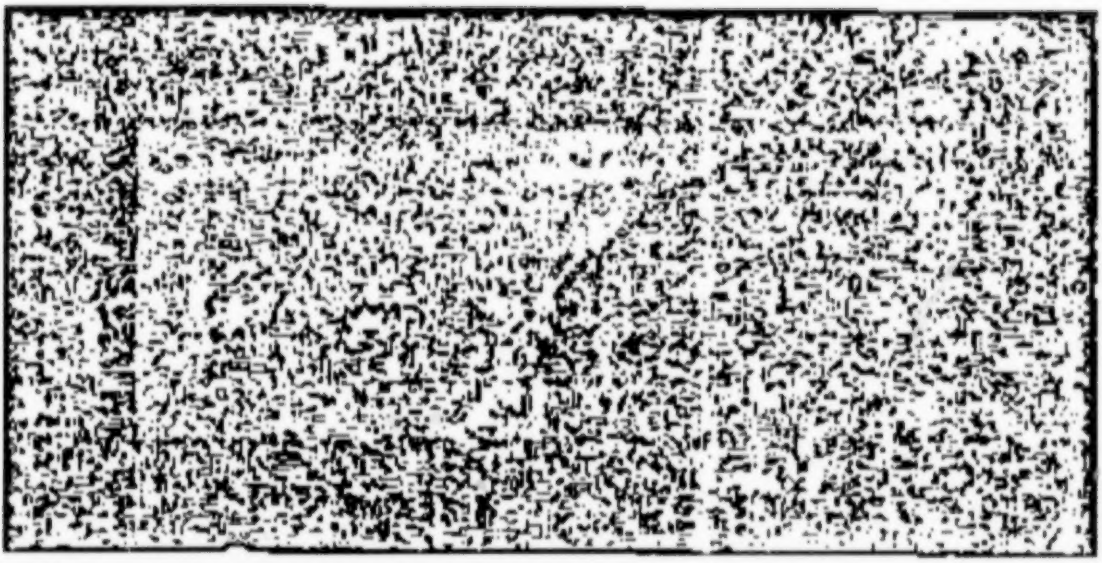
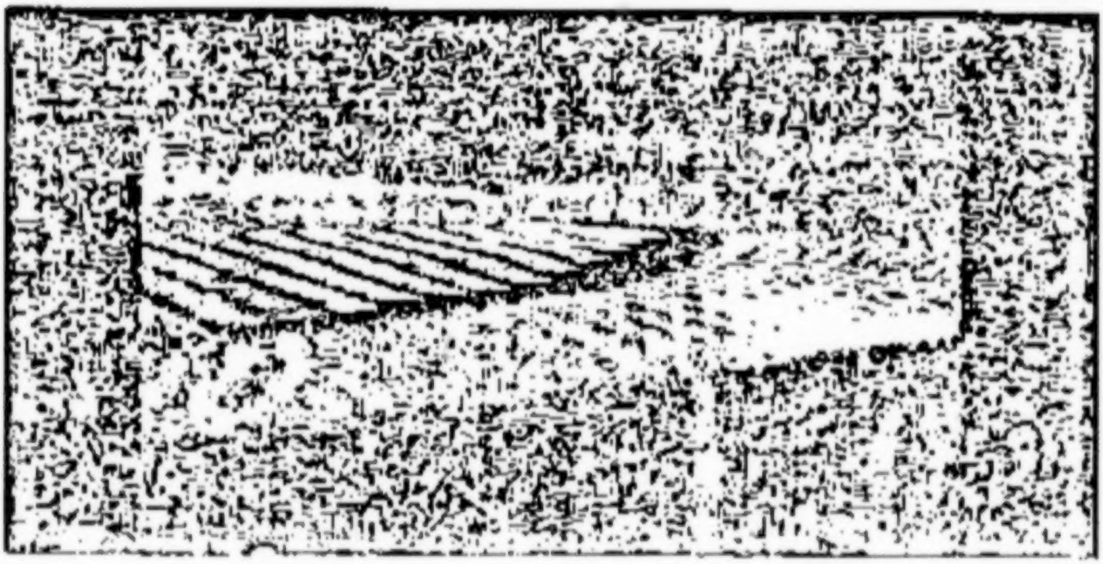
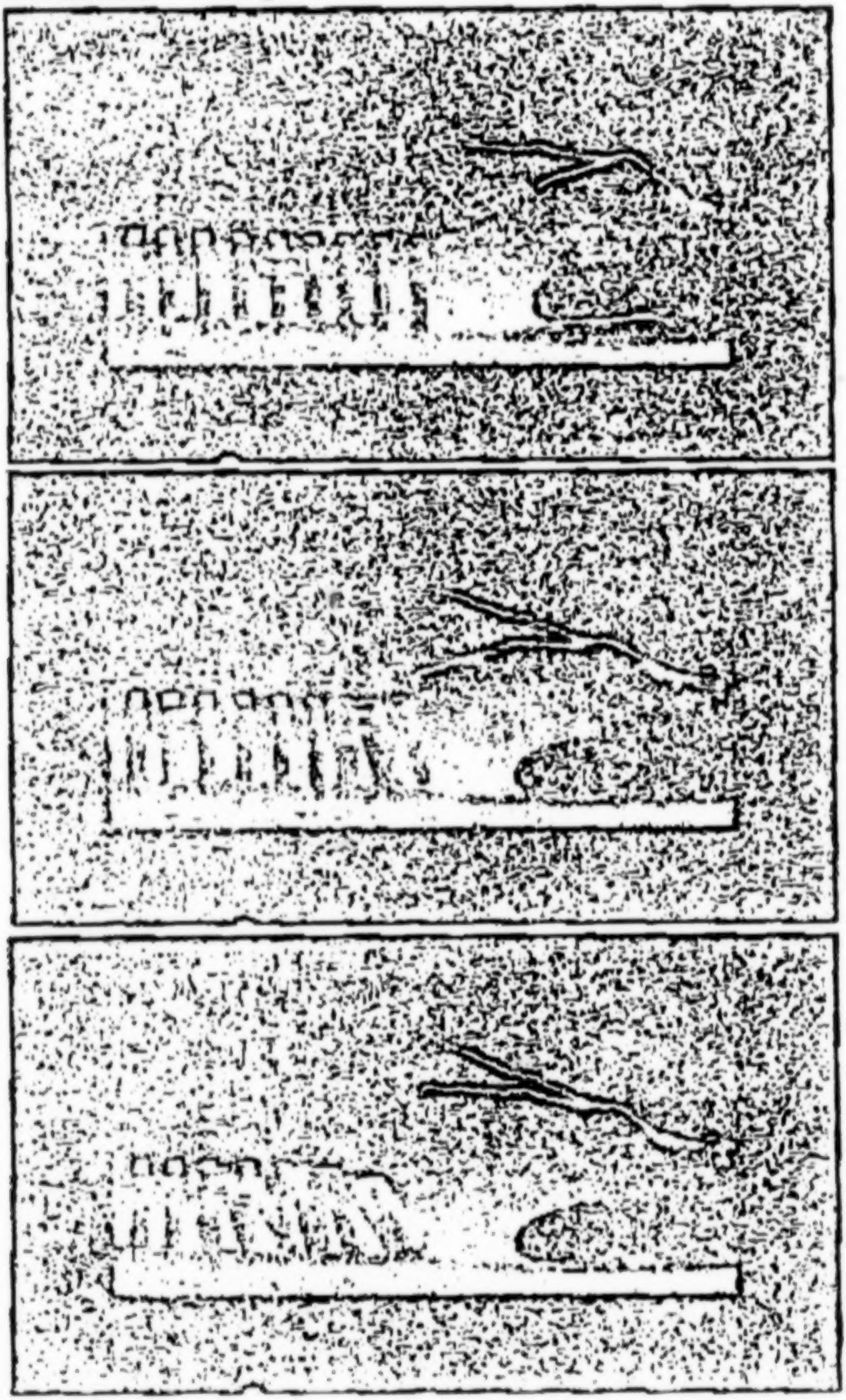
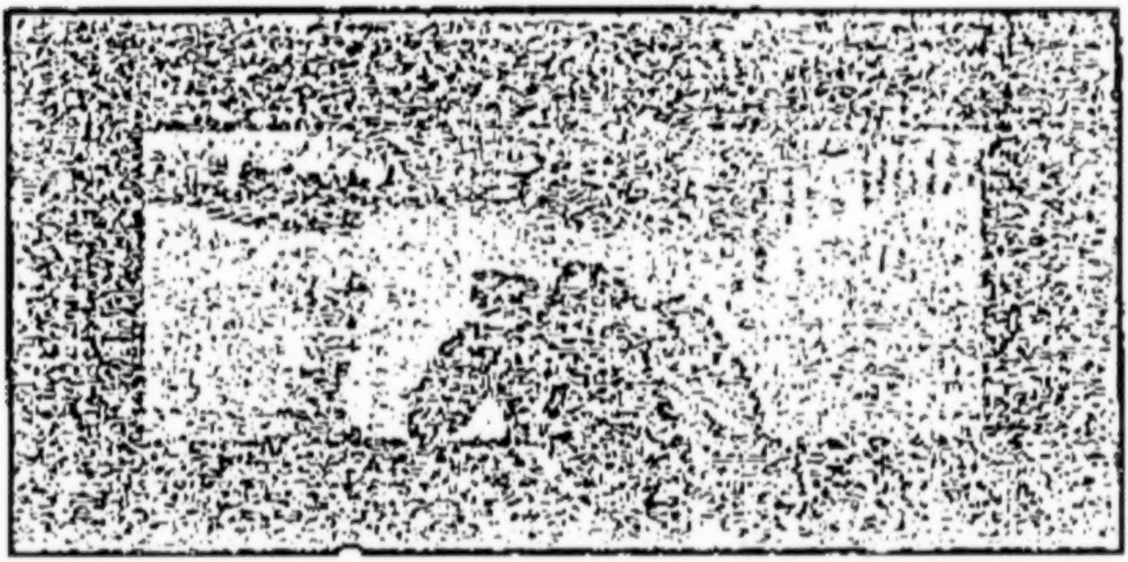


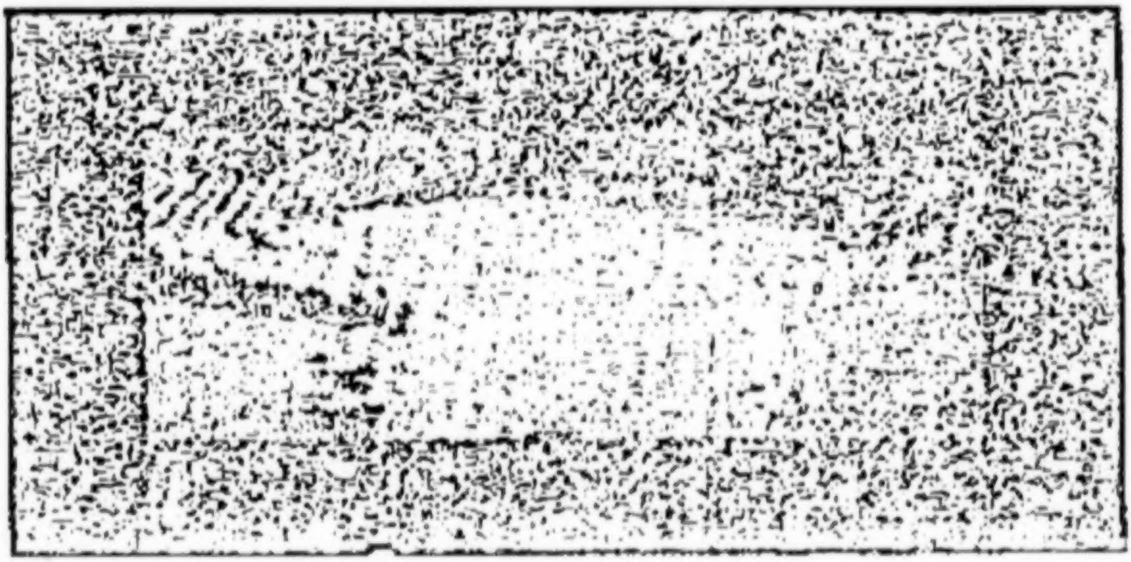


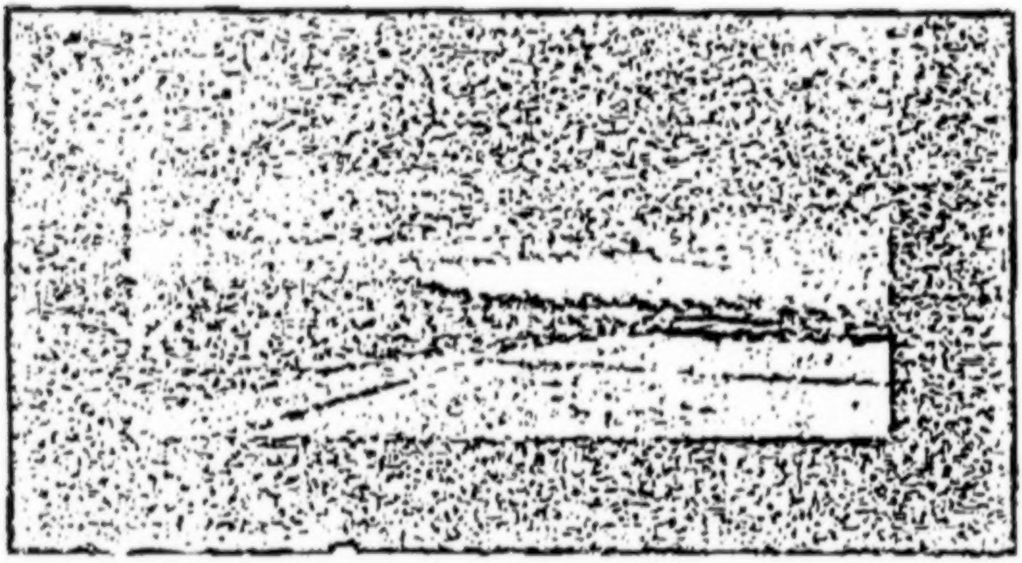
(c) an initiation signal that kicks the logic circuit(s) into action, analogous to ...;

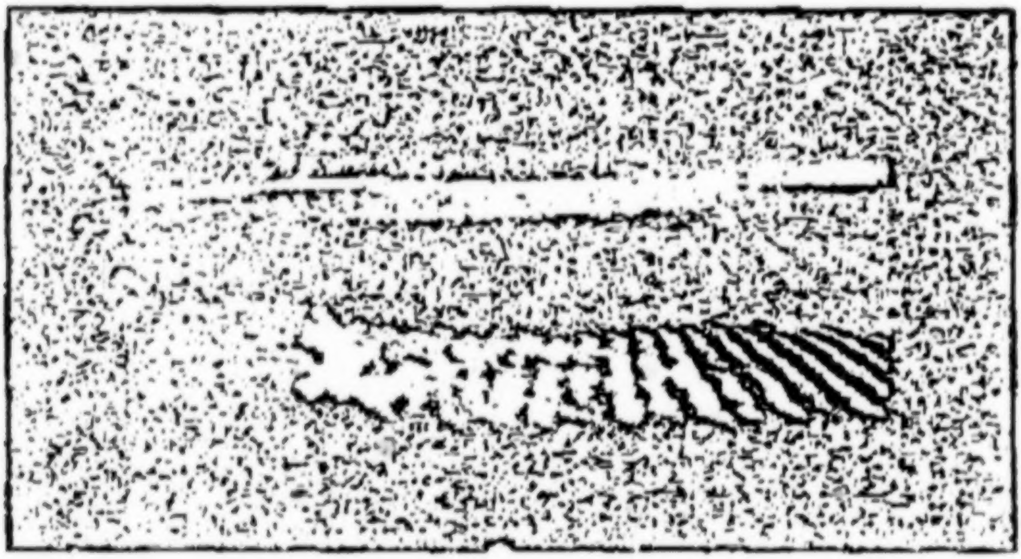


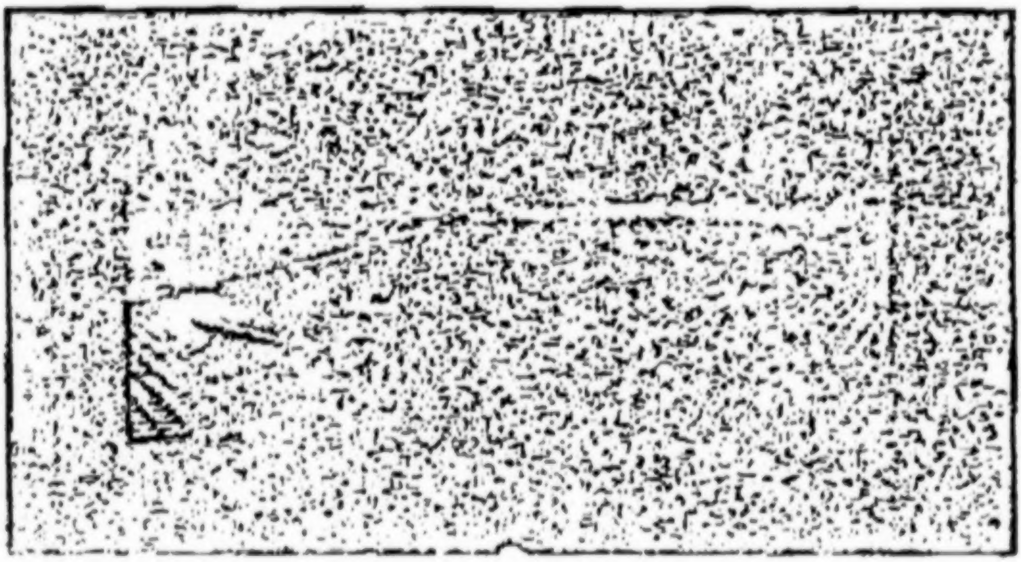
such that (d) after initiation, the states of the various program-selected, program-arranged, and program-timed computing elements as they interoperate in the manner specified by the computer program may be observed/recorded/mapped analogous to …;

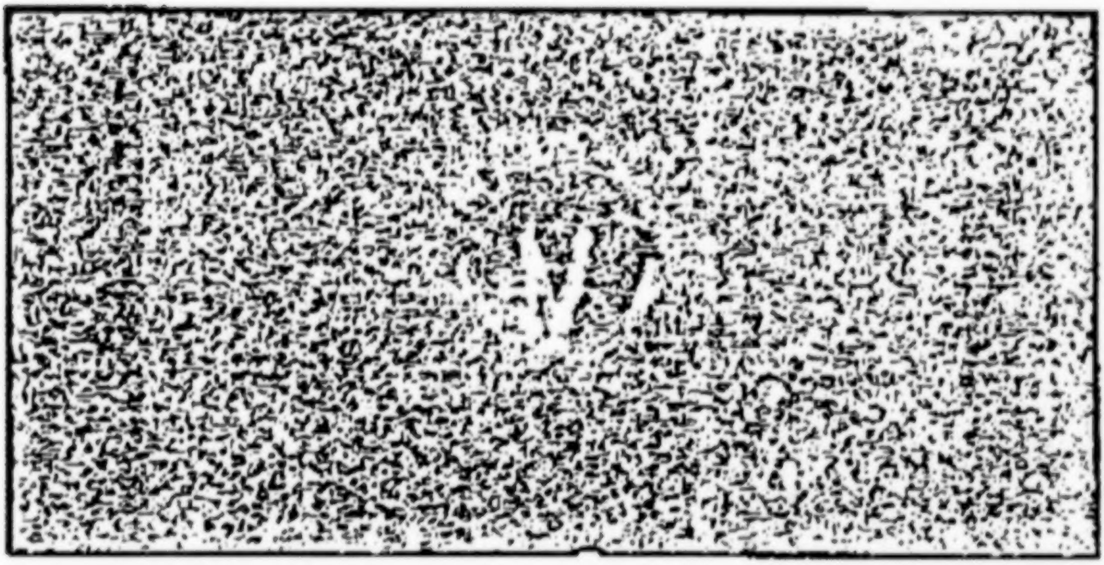


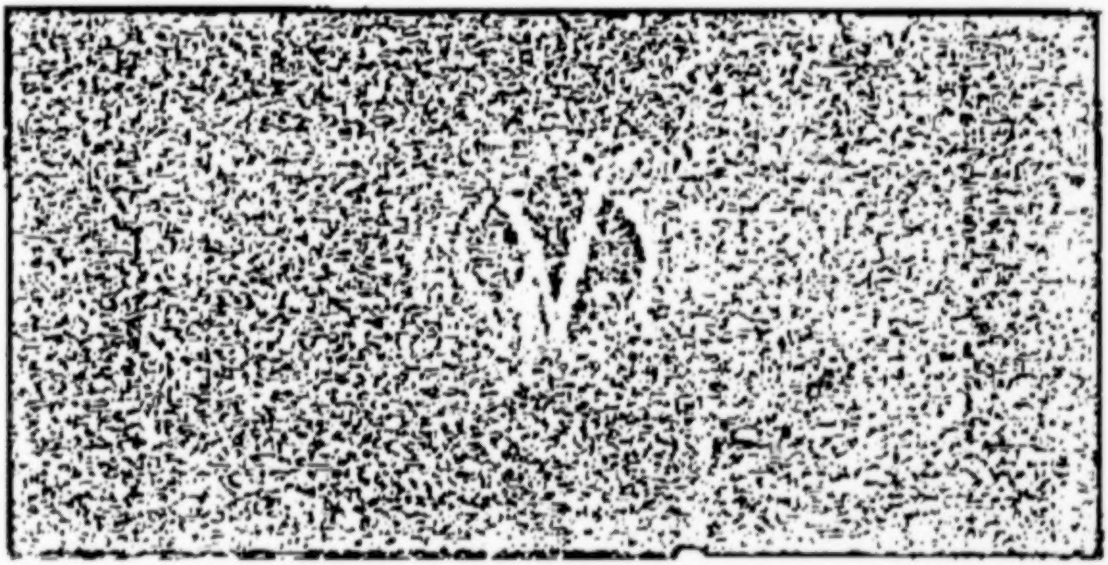


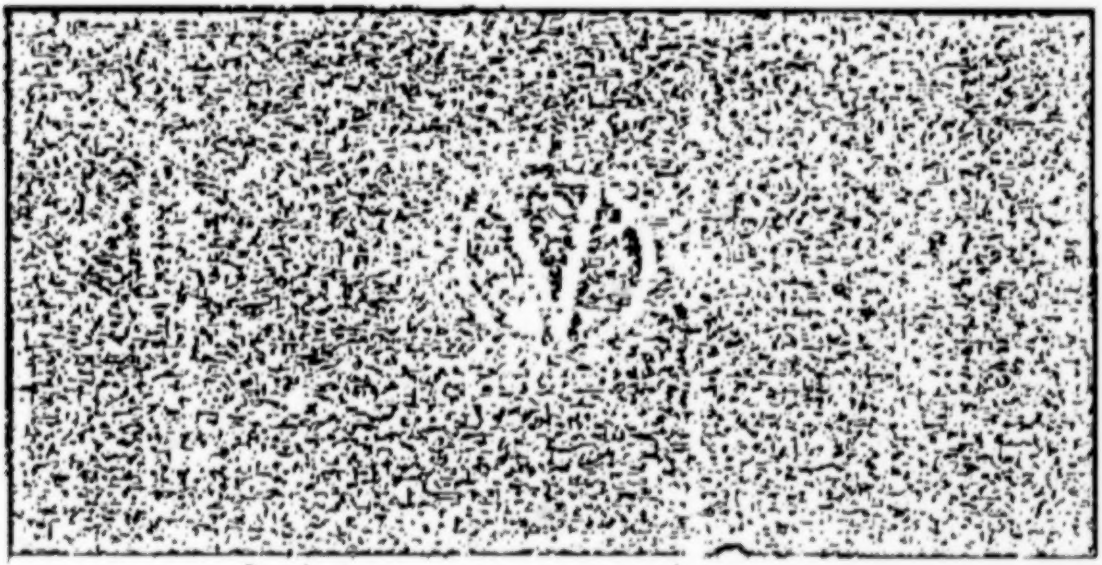




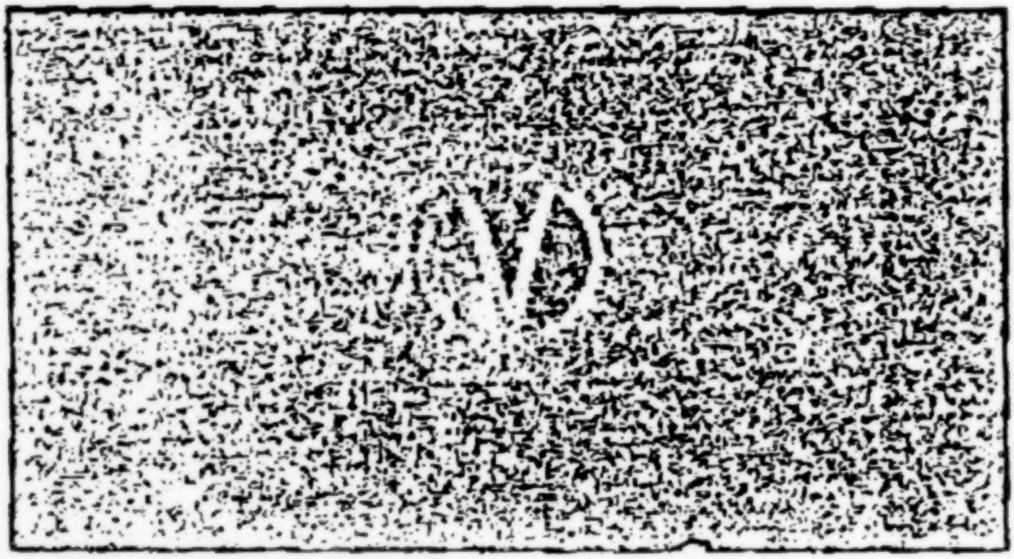








until, (e) ultimately, the flowing pattern/process generated by the interoperating computing circuits gives the result of a set of determined and discrete machine states which manifest a pattern that both (i) can be perceived by and (ii) confers meaning to an observing human, which is analogous to ...:



This mechanical contrivance is analogous to electronic processes-emergent-with-program-assembled-machines-in-operation, but constitutes mechanical processes-emergent-with-program-assembled-machines-in-operation in its own right. But it is not new. There is no need to augur this, as in the judge-created exceptions to otherwise patentable subject matter. Lack of novelty can be objectively demonstrated for the domino message transmission machine and process. Amici urge the Court to vitiate the inscrutable judge-created exceptions to otherwise patentable subject matter in view of criteria that can be demonstrated via objective evidence.

The precision and control of the domino process/pattern that dynamically flowed and was called into being as the dominoes fell into each are anything but

abstract, and result in intermediate/ending states of discrete red-black (binary) dominoes.

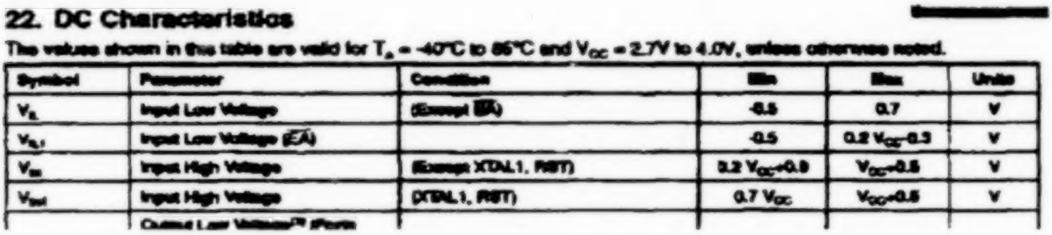
The result is a red-black pattern recognized by the viewer as the letter "V" for Specific, an Antonym of Abstract. Amici note that the red-black dominos constitute:

> (a) Tangible Perceptions (humanly perceivable differences – formally "data"): something is tangible if it can produce data (plural of datum). Data are one or more differences that can be registered by one or more of the human physical senses (sight, hearing, touch, smell, etc.); the process/result of the process is tangible because it produces a pattern of red-black differences that are perceivable by human vision;
>
> (b) Concrete Meaning (humanly understandable data – formally "information"): information is a difference (data) that makes a difference to someone. Here, the result of the process has concrete meaning in that an English reader can discern the human-semantic letter "V" from the red-black pattern, via a priori known letters of the English alphabet; and
>
> (c) Useful Information (humanly valuable information): the result is valuable in that it allows the Court to understand that Alice's technologies are not anything like what a human does with pen and paper, and are not the human mind itself. The result allows the Court to understand just how far afield the courts have been led in that it provides an analogy demonstrating claimed computational processes are the polar opposite of abstract.

Beyond the foregoing, the courts have been misled into concluding that since digital computers do nothing more than basic arithmetic on a string of binary numbers, such at 10010100 + 00000011, computational processes are not patentable. Such arguments have been successful in that, like all good advocacy that wrongly carries the day, it is sometimes true that computers do binary arithmetic.

However, this partial truth has been used to obscure the fact that in electronic computing it is always true that the machine selection and control codes expressed as zeros and ones[4] specify voltage levels and timing signals of the microprocessor. This truth in its entirety should override the partial truth touted above.

As an aid to the Court, Appendix A contains documentation of an Atmel 8-bit microcontroller which states on page 26: "... Inputs ... driven at ... –0.5V for a logic 1 and 0.45V for a logic 0." Amicus reproduces here characteristics for the microcontroller, which can be found on page 22 of Atmel documentation:



22. DC Characteristics

The values shown in this table are valid for T_A = -40°C to 85°C and V_{CC} = 2.7V to 4.0V, unless otherwise noted.

Symbol	Parameter	Condition	Min	Max	Units
V_{IL}	Input Low Voltage	(Except $\overline{EA}$)	-0.5	0.7	V
V_{IL1}	Input Low Voltage ($\overline{EA}$)		-0.5	0.2 V_{CC}-0.3	V
V_{IH}	Input High Voltage	(Except XTAL1, RST)	0.2 V_{CC}+0.9	V_{CC}+0.5	V
V_{IH1}	Input High Voltage	(XTAL1, RST)	0.7 V_{CC}	V_{CC}+0.5	V
	Output Low Voltage[1] (Ports				

---

[4] Translation from the source code (human readable) to the object code (binary machine readable) is deterministic and is done by another program (a compiler program), the output of which has to be tightly coupled to the Instruction Set Architecture that mates with the particular hardware of the microprocessor in use. The Instruction Set Architecture is expressed as zeroes and ones but represents voltages as appropriate to the vendor of the microprocessor (e.g., Intel, Atmel, etc.)

Atmel microcontroller documentation is dense, but states that input logic zero (0 = "low"), V_{IL} (voltage-for-logic-0-low) can be as low as NEGATIVE .5 volts (- .5 volts), and input logic one (1 = "high"), V_{IH} (voltage-for-logic-1-high) can be as high as POSITIVE 4.5 volts (+ 4.5 volts). So the binary strings associated with the processor do not represent a mere "digital computer . . . [that] operates on data expressed in digits, solving a problem by doing arithmetic as a person would do it by head and hand" as the courts have been led erroneously to believe. Amicus asks that the Court take the opportunity to see through these deceptions and set things right.

Amicus hopes that this brief analogy and illustration help the Court avoid confusion. We intelligently speak of the mind apart from the brain, and Alice – in order to provide legally valid/infringeable patent claims under the law – claims computational processes apart from the machines from/with which they emerge. Alice's processes are integral and inseparable from the machines from which they emerge just as the human mind is integral and inseparable from the human brain. Yet Alice's computational processes are not the human mind, nor are the voltage and timing signals of Alice's machines the human mind doing binary arithmetic with pen and paper. The Court should put such clever deceptions to rest.

V. Judge-Created Exceptions Are Not in Accord with Attorney Client Duties, and Place Attorneys at Risk of the Same Theory That Generated Akin Gump Legal Malpractice Verdict

A patent malpractice verdict – $72.6 million dollars – was recorded against the law firm of Akin

Gump on behalf of plaintiff AMT. The damages theory, on remand from the CAFC, was simple. The licensed attorney, through the use of continuing applications before the PTO, generated a multi-year delay in obtaining the maximum legal rights to which AMT was entitled in view of the objective evidence ("prior art"). Later obtained claims read on accused infringing products; earlier claims did not. AMT was disappointed to find damages run from date of issuance of patent claims, not the priority date of claims. AMT sought lost compensation for the time window of the delay. (Appendix B). Amount of calculated damages during that time window was around $100 million; jury awarded $72.6 million. (Appendix B).

If Alice's patents are held invalid on the basis of judge-created exceptions to otherwise statutory subject matter, all client rights will be obviated on the basis a shifting and uncertain "standard" – upon which no judges/Justices can agree. It takes exactly one patent attorney who will aver that he could have drafted valid and infringed claims to map this case directly to the negligence theory of Akin Gump.

Amicus asks the Court to abolish such judge-created exceptions in favor of objective criteria on at least this basis.

VI. Claims Should Not be Invalidated Based on Personal Philosophical/Religious Convictions of Reviewing Judge

Alice's legal instruments reach this Court with complete disregard for the language of the most stringently legal parts of such instruments. Instead, invalidation appears hinged on the personal religious/philosophical convictions of each reviewing judge:

> The abstractness and natural law preclusions not only make sense, they explain the purpose of the expansive language of section 101. Natural laws and phenomena can never qualify for patent protection because they cannot be invented at all. After all, God or Allah or Jahveh or Vishnu or the Great Spirit provided these laws and phenomena as humanity's common heritage. Furthermore, abstract ideas can never qualify for patent protection because the Act intends, as section 101 explains, to provide "useful" technology. An abstract idea must be applied to (transformed into) a practical use before it qualifies for protection. The fine print of Supreme Court opinions conveys nothing more than these basic principles. Yet this court expands (transforms?) some Supreme Court language into rules that defy the Supreme Court's own rule.

In re Bilski, 545 F.3d 943 (Fed. Cir. 2008) (Rader dissent).

Legal instruments should not be invalidated by the personal religious or philosophical beliefs of the reviewing judges; rather, they should be evaluated in view of the law that formed context for the legal strategies employed by the attorneys as they drafted the legal instruments. Statutory classes matter, especially with respect to processes-emergent-from-program-assembled-machines-in-operation-OR-program- assembled-machines-proper.

This Court should eliminate judge-created exceptions in lieu of other more fair and objective-evidence-based considerations, such as novelty, in accord with attorney-client duties.

VII. Patent Infringement Law Varies with Statutory Class; Markman Should be Required and Take Into Account the Statutory Class of Construed Claims

After an attorney understands the technologies and the business objectives of her client, she starts to look at the applicable law implicated by the technologies and business objectives. If her client has made factual averments that certain statutory subject matters are novel,[5] in view of her ethical rules and fiduciary duties, the first place the attorney looks is at the patent statutes 35 U.S.C. § 154 (defining exclusionary rights) and 35 U.S.C. § 271 (defining the who, the what, and the how of enforcing the exclusionary rights through patent infringement suits). 35 U.S.C. § 154(a) defines the fundamental "right to exclude others from making, using, offering for sale, or selling the [claimed] invention." 35 U.S.C. § 271 defines who can be sued, for what that who can be sued, and how that who can be sued via a number of different statutorily defined infringement schemes (e.g., direct literal infringement (271(a)), inducement of infringement (271(b)), contributory infringement (271) (c)), etc.). Relevant to Alice's technologies is 35 U.S.C. §271(a) which recites: "whoever without authority makes, uses, offers to sell, or sells any ... [claimed] invention, within the United States ...during the term of the patent ...infringes."

---

[5] "Anticipation is a question of fact.... Obviousness is a question of law based on underlying facts." *Cross v. Medtronic*, 424 F.3d 1293 (Fed. Cir. 2005).

After the attorney has consulted the exclusion/ infringement statutes, the attorney turns to the judge-made law implicated by the technologies and business objectives of his client. This is where things get complex for processes-emergent-from-program-assembled-machines-in-operation-OR-program-assembled-machines-proper. The fundamental statutory function of the claims in a patent is notice that the patent owner is claiming a right to exclude others – through the vehicle of patent infringement lawsuits – from commercial use of definitely identified technologies.

For IA technologies notice is very complicated because the technology itself is very subtle – creating information via the intersection of machine objectivity and human subjectivity. The machines are not processes; the processes emerge with the mapped states of machines-in-operation, yet are not machines. The attorney must hyper-focus on whether she is drafting a claim to post-issuance patent infringement rights founded upon the circuitry-as-set-up-and-sequenced-by-the-computer program (a MACHINE) OR founded upon mapped states dynamically emergent from such circuitry-in-operation (a PROCESS). A machine is not a process; a process is not a machine.

Enforcement of IA technology infringement rights is very complicated due to the fact that such technologies can easily be "parted up." This feature allows infringers to enjoy substantial revenues from U.S. commerce – while evading U.S. patent laws – by placing all or part of the "infringer's" processes-emergent-from-program-assembled-machines-in-operation-OR-program-assembled-machines-proper where the United States has no legal jurisdiction (e.g., Canada).

Prior to the introduction of the CAFCIndustrialAge Test, an attorney could draft claims that were legally valid and infringeable, provided that the attorney was mindful of the IA technologies law associated with each claimed statutory class. The CAFCIndustrialAge Test makes this now impossible/impracticable since it requires "hybrid claims" – claims that mix two or more statutory classes of claims (e.g., a process claim with machine limitations).

Good news? Hybrid claims likely satisfy the CAFCIndustrialAge Test. Bad news? Hybrid claims generate high post issuance enforcement risks/costs in view strong attorney arguments that such claims are invalid as a matter of law for failing statutory notice requirements.

Further bad news? Hybrid claims generate high post issuance enforcement risks/costs in view of strong attorney argument based on the multi-sovereign infringer gambit.

The Court should grant Alice's petition to address and solve this dilemma.

"Hybrid" claims – such as a primarily "machine" (statutory-class one) claim drafted to include one or more "process" (statutory-class two) limitations – to program-assembled-machines-proper are subject to strong/expensive arguments that such claims are invalid as a matter of law:

> Claim construction is a question of law. . . . Similarly, indefiniteness is a question of law.... we review ... whether the prevailing party is entitled to judgment as a matter of law.... district court found that claim 25 is indefinite under 35 U.S.C. § 112, as it attempts to claim both a system and a method for using that system...." ... A claim is

> considered indefinite if it ... "is not sufficiently precise to provide competitors with an accurate determination of the 'metes and bounds' of protection involved".... Because claim 25 recites both a system and the method for using that system, it does not apprise a person of ordinary skill in the art of its scope, and it is invalid under Section 112, paragraph 2.

IPXL Holdings v. Amazon.com, 430 F.3d 1377 (Fed. Cir. 2005); *Katz Interactive v. Am. Airlines*, 639 F.3d 1303 (Fed. Cir. 2011).

IPXL's "hybrid" claims – a mix of machine and process statutory classes such as is mandated by the CAFCIndustrialAge Test – "invalid as a matter of law." Statutory class matters.

"Hybrid" claims – such as a primarily "process" (statutory-class one) claim drafted to include one or more "machine" (statutory-class two) limitations – to processes-emergent-with-program-assembled-machines-in-operation are subject to strong/expensive arguments that such "hybrid" claims are unenforceable as a matter of law based on the multi-sovereign infringer gambit:

> We therefore hold that a process cannot be used "within" the United States as required by section 271(a) unless each of the steps is performed within this country. ... each of the asserted method claims ... recites a step that utilizes an "interface" or "interface switch," which is only satisfied by the use of RIM's Relay located in Canada. Therefore, as a matter of law, these claimed methods could not be infringed by use of RIM's system. ....

> ... a finding of direct infringement by RIM's customers under section 271(a) of the method claims reciting an "interface switch" or an "interface" is precluded by the location of RIM's Relay in Canada....

NTP, Inc. v. Research In Motion, Ltd., 418 F.3d 1282 (Fed. Cir. 2005).

NTP's "hybrid" claims – a mix of process and machine statutory classes such as is mandated by the CAFCIndustrialAge Test – "unenforceable as a matter of law." Statutory class matters.

The CAFC has attempted to fashion a "safe harbor" for drafting attorneys to forestall evasion of U.S. patent rights through the multi-sovereign gambit. System claims are "safe harbor" in that "use" of such a system from within the U.S. will provide a valid patent infringement suit despite the fact that a portion of the system may lie outside of United States jurisdiction. *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282 (Fed. Cir. 2005) ("...location of the Relay in Canada did not, as a matter of law, preclude infringement of the asserted system claims....").

Despite RIM's multi-sovereign gambit, machine class claims of NTP valid and infringed. Statutory class matters.

DILEMMA: For processes-emergent-from-program-assembled-machines-in-operation-OR-program-assembled-machines-proper, the CAFCIndustrialAge Test seems to require that an attorney achieve patentable subject matter at the expense of claims subject to strong (and thus expensive) attorney argument that such claims are invalid "as a matter of law" (*IPXL v. Amazon*) OR unenforceable "as a matter of law" (*NTP v. RIM*) . Or vice versa. Can this be true?

The Court should grant Alice's petition to address and resolve this dilemma.

VIII. A Markman Would Remedy Much Confusion, Except For The Dilemma Arising from Applying Industrial Age Law to Information Age Technologies, Which This Court Must Address And Resolve

This Court understands that the CAFCIndustrialAge Test is not appropriate to processes-emergent-from-program-assembled-machines-in-operation-OR-program-assembled-machines-proper: "machine-or-transformation test ... Industrial Age-... grounded in a physical or other tangible form.... doubt whether test ... determining the patentability of inventions in the Information Age." *Bilski v. Kappos*, 130 S. Ct. 3218 (U.S. 2010).

The CAFC Information Age Law, which to date this great Court has only seen and heard in distorted caricature, is an awe-inspiring logical cathedral that does not create Hobson's choice of the CAFCIndustrialAge Test.

The Court is urged to validate some version of the CAFC's Information Age Law.

CONCLUSION

Petition for writ of certiorari should be granted.

Respectfully submitted,

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October 4, 2013

APPENDIX

APPENDIX A

ATMEL
[LOGO]

8-bit Low-Voltage Microcontroller with 4K Bytes In-System Programmable Flash

AT89LS51

Features

- Compatible with MCS®-51 Products
- 4K Bytes of In-System Programmable (ISP) Flash Memory – Endurance: 10,000 Write/Erase Cycles
- 2.7V to 4.0V Operating Range
- Fully Static Operation: 0 Hz to 16 MHz
- Three-level Program Memory Lock
- 128 x 8-bit Internal RAM
- 32 Programmable I/O Lines
- Two 16-bit Timer/Counters
- Six Interrupt Sources
- Full Duplex DART Serial Channel
- Low-power Idle and Power-down Modes
- Interrupt Recovery from Power-down Mode
- Watchdog Timer
- Dual Data Pointer
- Power-off Flag
- Flexible ISP Programming (Byte and Page Mode)
- Green (Pb/Halide-free) Packaging Option

1. Description

The AT89LS51 is a low-voltage, high-performance CMOS 8-bit microcontroller with 4K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80051 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89LS51 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications.

The AT89LS51 provides the following standard features: 4K bytes of Flash, 128 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, two 16-bit timer/counters, a five-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89LS51 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next external interrupt or hardware reset.

22. DC Characteristics

The values shown in this table are valid for T_A = -40°C to 85°C and V_{CC} = 2.7V to 4.0V, unless otherwise noted.

Symbol	Parameter	Condition	Min	Max	Units
V_{IL}	Input Low Voltage	(Except $\overline{EA}$)	-0.5	0.7	V
V_{IL1}	Input Low Voltage ($\overline{EA}$)		-0.5	0.2 V_{CC}-0.3	V
V_{IH}	Input High Voltage	(Except XTAL1, RST)	0.2 V_{CC}+0.9	V_{CC}+0.5	V
V_{IH1}	Input High Voltage	(XTAL1, RST)	0.7 V_{CC}	V_{CC}+0.5	V
V_{OL}	Output Low Voltage[1] (Ports 1,2,3)	I_{OL} = 0.8 mA		0.45	V
V_{OL1}	Output Low Voltage[1] (Port 0, ALE, $\overline{PSEN}$)	I_{OL} = 1.6 mA		0.45	V
V_{OH}	Output High Voltage (Ports 1,2,3, ALE, $\overline{PSEN}$)	I_{OH} = -60 µA	2.4		V
		I_{OH} = -25 µA	0.65 V_{CC}		V
		I_{OH} = -10 µA	0.80 V_{CC}		V
V_{OH1}	Output High Voltage (Port 0 in External Bus Mode)	I_{OH} = -800 µA	2.4		V
		I_{OH} = -300 µA	0.75 V_{CC}		V
		I_{OH} = -80 µA	0.9 V_{CC}		V
I_{IL}	Logical 0 Input Current (Ports 1,2,3)	V_{IN} = 0.45V		-50	µA
I_{TL}	Logical 1 to 0 Transition Current (Ports 1,2,3)	V_{IN} = 2V		-150	µA
I_{LI}	Input Leakage Current (Port 0, $\overline{EA}$)	$0.45 < V_{IN} < V_{CC}$		±10	µA
RRST	Reset Pulldown Resistor		50	300	KΩ
C_{IO}	Pin Capacitance	Test Freq. = 1 MHz, T_A = 25°C		10	pF
I_{CC}	Power Supply Current	Active Mode, 12 MHz		25	mA
		Idle Mode, 12 MHz		6.5	mA
	Power-down Mode[2]	V_{CC} = 4.0V		30	µA

Notes:
1. Under steady state (non-transient) conditions, I_{OL} must be externally limited as follows:
   Maximum I_{OL} per port pin: 10 mA
   Maximum I_{OL} per 8-bit port:
   Port 0: 26 mA Ports 1, 2, 3: 15 mA
   Maximum total I_{OL} for all output pins: 71 mA
   If I_{OL} exceeds the test condition, V_{OL} may exceed the related specification. Pins are not guaranteed to sink current greater than the listed test conditions.
2. Minimum V_{CC} for Power-down is 2V.

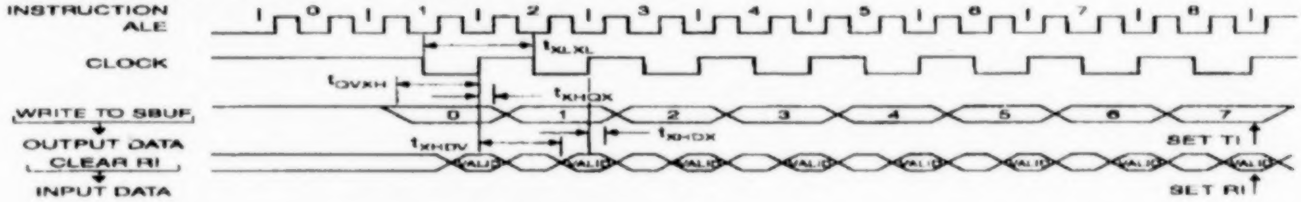
3a

29. Serial Port Timing: Shift Register Mode Test Conditions

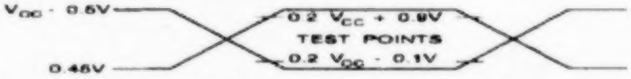
The values in this table are valid for V_{CC} = 2.7V to 4.0V and Load Capacitance = 80 pF.

Symbol	Parameter	12 MHz Osc		Variable Oscillator		Units
		Min	Max	Min	Max	
t_{XLXL}	Serial Port Clock Cycle Time	1.0		$12t_{CLCL}$		µs
t_{QVXH}	Output Data Setup to Clock Rising Edge	700		$10t_{CLCL}$-133		ns
t_{XHQX}	Output Data Hold After Clock Rising Edge	50		$2t_{CLCL}$-80		ns
t_{XHDX}	Input Data Hold After Clock Rising Edge	0		0		ns
t_{XHDV}	Clock Rising Edge to Input Data Valid		700		$10t_{CLCL}$-133	ns

30. Shift Register Mode Timing Waveforms

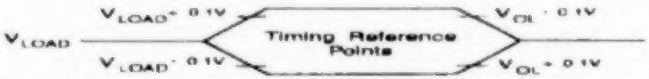

INSTRUCTION
ALE
CLOCK
WRITE TO SBUF
OUTPUT DATA
CLEAR RI
INPUT DATA
0
1
2
3
4
5
6
7
8
t_{XLXL}
t_{QVXH}
t_{XHQX}
t_{XHDV}
t_{XHDX}
VALID
SET TI
SET RI

31. AC Testing Input/Output Waveforms[1]


V_{CC} - 0.5V
0.45V
0.2 V_{CC} + 0.9V
TEST POINTS
0.2 V_{CC} - 0.1V

Note: 1. AC Inputs during testing are driven at V_{CC} - 0.5V for a logic 1 and 0.45V for a logic 0. Timing measurements are made at V_{IH} min. for a logic 1 and V_{IL} max. for a logic 0.

32. Float Waveforms[1]


V_{LOAD}
V_{LOAD}+ 0.1V
V_{LOAD}- 0.1V
Timing Reference Points
V_{OL} - 0.1V
V_{OL} + 0.1V

Note: 1. For timing purposes, a port pin is no longer floating when a 100 mV change from load voltage occurs. A port pin begins to float when a 100 mV change from the loaded V_{OH}/V_{OL} level occurs.

APPENDIX B

IN THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF TEXAS SAN ANTONIO DIVISION

[Filed June 27, 2003]

Cause No. SA03CA0541 RF

AIR MEASUREMENT TECHNOLOGIES, INC. AND
NORTH-SOUTH CORPORATION AND
LOUIS HERBERT STUMBERG, JR.

v.

GARY HAMILTON, HAMILTON &
TERRILE, L.L.P., MATTHEWS &
BRANSCOMB, P.C. AND
AKIN GUMP STRAUSS HAUER & FELD, LLP

NOTICE OF REMOVAL CIVIL ACTION

To the Honorable United States District Judge:

Pursuant to 28 U.S.C. §§ 1338, 1441 and 1446, Defendants Gary Hamilton and Hamilton & Terrile, L.L.P. (the "Hamilton Defendants") hereby remove this action from the 131st Judicial District Court of Bexar County, Texas, where it was filed as Cause No. 2003-CI-08100 (the "State Court Action"), to the United States District Court for the Western District of Texas, San Antonio Division. As the grounds for removal, the Hamilton Defendants state as follows:

1. Plaintiffs Air Measurement Technologies, Inc. and North-South Corporation and Louis Herbert

Stumberg, Jr. ("Plaintiffs") filed their Original Petition in the State Court Action on May 28, 2003, in the 131st Judicial District Court of Bexar County, which is located within the San Antonio Division of the Western District of Texas.

2. Defendant received Citation and a copy of Plaintiffs' Original Petition on May 28, 2003. Thereafter, on May 30, 2003, Plaintiffs served the Hamilton Defendants with a copy of their First Amended Petition. The Hamilton Defendants timely filed their Answer in the State Court Action on June 20, 2003.

3. Copies of all process, pleadings, and orders served upon or filed by the Hamilton Defendants in the State Court Action as well as a certified copy of the docket sheet in the State Court Action are collectively attached as Exhibit "A" and incorporated herein by reference.

4. This is a civil action over which this Court has original patent question jurisdiction under the provisions of 28 U.S.C. § 1338, and therefore is a civil action that may be removed to this Court pursuant to the provisions of 28 U.S.C. §§ 1441 and 1446. "An action arises under the patent laws if the complaint includes allegations that federal patent law creates the cause of action or federal patent law is a necessary element of the [state law] claim." *Scherbatskoy v. Haliburton Co.*, 125 F.3d 288, 291 (5th Cir. 1997) (emphasis added).

5. Plaintiffs' Original Petition and First Amended Petition assert a legal malpractice claim, which assails the Hamilton Defendants' handling of Plaintiffs' patents, and, more specifically, complains of how the Hamilton Defendants' conduct impaired certain

patent infringement lawsuits filed by Plaintiffs. In their Original and First Amended Petitions, Plaintiffs contend that the Hamilton Defendants' conduct gave rise to the "on sale bar" defense pursuant to 35 U.S.C. § 102(b) and the "inequitable conduct" defense pursuant to 35 U.S.C. § 112. *See* Pls.' Pets.' at § IV, ¶¶ 5-6. The Plaintiffs also contend that the Defendants' settlement of one patent infringement suit impaired the value of Plaintiffs' remaining patent suits. Plaintiffs' legal malpractice claim necessarily requires the resolution of at least one substantial question of federal patent law, and therefore patent question jurisdiction is proper in this Court under 28 U.S.C. § 1338.

6. Plaintiffs also assert additional state law claims in their Petition. These claims either also invoke federal patent jurisdiction, or, alternatively, are properly removed pursuant to 28 U.S.C. § 1441(c).

7. The Plaintiffs did not request a jury trial in the state court action. The Hamilton Defendants did not request a jury trial in the state court action. Defendant Akin Gump has demanded a jury and has tendered the fee.

8. This Notice of Removal is timely because it is filed within thirty (30) days from the date the Hamilton Defendants received a copy of Plaintiffs' Original Petition. *See* 28 U.S.C. § 1446 (b). More specifically, this Notice of Removal is filed within thirty (30) days of the date Plaintiffs filed their Original Petition in the State Court Action.

9. All Defendants have consented to this removal by affixing their signatures to the Notice of Consent to Removal filed herewith. The Notice Consent to Removal is timely because it was filed with this Court

within thirty (30) days from the first date that any Defendant received a copy of Plaintiffs' Original Petition.

10. As required by 28 U.S.C. § 1446(d), written notice of the filing of this Notice of Removal is being filed this day with the Clerk of the District Court of Bexar County, Texas.

WHEREFORE, PREMISES CONSIDERED, the Hamilton Defendants request that this Court assume jurisdiction over this controversy and that this matter proceed in the United States District Court for the Western District of Texas from this day forward.

Respectfully submitted,

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Attorneys For Defendants
Gary L. Hamilton AND Hamilton & Terrile, L.L.P.

IN THE DISTRICT COURT
131st JUDICIAL DISTRICT
BEXAR COUNTY, TEXAS

[Filed May 29, 2003]

No. 2003CI08100

AIR MEASUREMENT TECHNOLOGIES, INC.
AND NORTH-SOUTH CORPORATION,
AND LOUIS HERBERT STUMBERG, JR.,

Plaintiffs,

v.

GARY L. HAMILTON, HAMILTON &
TERRILE, L.L.P., MATTHEWS &
BRANSCOMB, P.C. AND AKIN GUMP
STRAUSS HAUER & FELD, L.L.P.,

Defendants.

PLAINTIFF'S ORIGINAL PETITION

* * * *

§ 112. Specification

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Patent No. 5,910,771 (the "771 Patent") was the broad form of claims covering the entire firefighting and safety industry, using Plaintiffs' Device. The 771 Patent could have been filed as early as 1990. Defendant Akin, however, acting through Defendant Hamilton, failed to timely prosecute the 771 Patent, delaying that application until 1997. In fact, upon subsequent inquiry, Mr. Hamilton assured Plaintiffs, that the broad claims of the 77 Patent "related back" to the original filing on August 6, 1991 of Patent No. 5,157,378 (the "378 Patent"). That statement was misleading and inaccurate, in that the term limitation of the Patent relates back to the August 6, 1991 filing, *but not* as to recoverable damages against an infringer. In other words, the effect of the delayed filing was to shorten the otherwise minimum 17-year period[3] during which Plaintiff had the protection of their Patent and Plaintiffs could not recover damages for infringements) prior to the date of filing. Plaintiffs did not learn of this distinction until Summer 2002, and only *after* Akin had withdrawn as Patent Litigation Counsel. As a consequence of this unwarranted and inexplicable delay, Plaintiffs lost significant past royalties under the "771" Patent. Sales of SCBA's and other infringing products covered by these Patents, have been approximately $100 million a year since 1998.

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[3] The General Agreement on Tariffs and Trade Uruguay Round Agreement Act ("GATT") (Pub. L. 103-465, § 2, Dec. 8, 1994, 108 Stat. 4813.), modifies 35 U.S.C.A. § 154 to extend the life of certain types of patents for an additional two years beyond the traditional 17-year period of protection. Under GATT for all continuation applications filed after June 8, 1995 the patent expires 20 years after the effective filing date of the application.

8. Continuing with their pattern of negligence and negligent misrepresentation, related to the term of Patents, Akin, through Mr. Hamilton assisted by Rhonda S. Jolley of M&B, inexplicably settled the *Draeger* litigation using only a 17-year term of Patent protection, related back to 1991. Consequently, all additional payments received as damages under the *Draeger* settlement were limited to sales of the Device through 2008. Under the *Gatt* Amendment, such additional payments should have been extended by an additional two years. In this settlement, Defendant Akin collected a contingency fee on the *Draeger* settlement ($1.0 million) of $263,202.52 after expenses of $122,658.26. In addition, Akin collected $119,752.00 in hourly fees and expenses from 1995 to the present date, for work on Plaintiffs' Patents. These fees were excessive and unconscionable in that Akin knew, at the time, that its own negligence was a cause of Plaintiffs' reduced recovery in the *Draeger* settlement.

9. In the course of the Patent Litigation, all but one of the several defendants alleged the "on sale" bar and "inequitable conduct" as defenses to Plaintiffs' infringement suits. Those Defendants making such defensive allegations filed counterclaims for attorney's fees based on those issues. The only Defendant which did not assert the "on sale" bar and/or inequitable conduct" as defenses was *Draeger* which settled without obtaining any written discovery.

10. The person dealing with the Defendants on behalf of the Companies was, at all times relevant here to, Louis Herbert Stumberg, Jr. The first occasion on which Mr. Stumberg was informed of the problem with the "on sale" bar rule

* * * *

IN THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF TEXAS SAN ANTONIO DIVISION

[Filed May 07, 2009]

NO. SA-03-CA-0541-RF

AIR MEASUREMENT TECNOLOGIES, INC.,
NORTH-SOUTH CORPORATION,
AND LOUIS HERBERT STUMBERG, JR.

Plaintiffs,

v.

AKIN GUMP STRAUSS
HAUER & FELD, L.L.P.

Defendants.

VERDICT FORM

Answer "Yes" or "No" to all questions unless otherwise instructed. A "Yes" answer must be based on a preponderance of the evidence unless you are otherwise instructed. If you do not find that a preponderance of the evidence supports a "Yes" answer, then answer "No." The term "preponderance of the evidence" means the greater weight of credible evidence admitted in this case. A preponderance of the evidence is not measured by the number of witnesses or by the number of documents admitted in evidence. For a fact to be proven by a preponderance of the evidence, you must find that the fact is more likely true than not true. Whenever a question requires an answer other than "Yes" or "No," your answer must be based on a preponderance of the evidence unless you are otherwise instructed.

QUESTION 1

(ANTICIPATION—PUBLICLY USED OR KNOWN)

Has Akin Gump proven by clear and convincing evidence that all of the claims in Plaintiffs' patents listed below are invalid because they were publicly used or known by others before March of 1990?

Answer "yes" or "no" for each patent listed below.

‘378 patent No

‘234 patent No

‘771 patent No

QUESTION 2

(ANTICIPATION—ON SALE BAR)

Has Akin Gump proven by clear and convincing evidence that all of the claims in Plaintiffs' patents listed below are invalid because of the on-sale bar?

Answer "yes" or "no" for each patent listed below.

‘378 patent No

‘234 patent No

‘771 patent No

QUESTION 3

(ANTICIPATION—PUBLIC USE)

Has Akin Gump proven by clear and convincing evidence that all of the claims in Plaintiffs' patents listed below are invalid because of public use?

Answer "yes" or "no" for each patent listed below.

'378 patent No

'234 patent No

'771 patent No

QUESTION 4

(ANTICIPATION—MADE OR INVENTED BY SOMEONE ELSE)

Has Akin Gump proven by clear and convincing evidence that the invention claimed in the patents below was made by someone else before March of 1990?

Answer "yes" or "no" for each patent listed below.

'378 patent No

'234 patent No

'771 patent No

QUESTION 5

(OBVIOUSNESS)

Has Akin Gump proven by clear and convincing evidence that all of the claims in Plaintiffs' patents listed below are invalid as obvious?

Answer "yes" or "no" for each patent listed below.

'378 patent No

'234 patent No

'771 patent No

QUESTION 6

(INEQUITABLE CONDUCT)

Has Akin Gump proven by clear and convincing evidence that any of those listed below failed to disclose to the PTO information that was material to the '378, '234, or '771 patents at issue, coupled with an intent to deceive or mislead?

Answer "yes" or "no" for each of those listed.

a. Branscomb No

b. Hamilton No

*(during the time between January 1, 1991 and April 30, 1995)

c. Plaintiffs No

If you have answered "No" to all of the questions above, then answer the following questions. Otherwise, do not answer the following questions.

QUESTION 7

Did the negligence, if any, of those named below proximately cause the injury in question?

"Injury in Question," means Plaintiffs' loss of reasonable royalties for the use of their patented invention.

Answer "Yes" or "No" to each of the following:

a.	Akin Gump	Yes
b.	Branscomb	No
c.	Hamilton & Terrile	No
d.	Gary Hamilton*	No

*(during the time between January 1, 1991 and April 30, 1995)

e.	Plaintiffs	No

If you answered "Yes" to Question 7 for more than one of those named above, then answer the following question. Otherwise, do not answer the following question and go to Question 9.

QUESTION 8

Assign percentages of responsibility only to those you found caused or contributed to cause the injury. The percentages you find must total 100 percent. The percentages must be expressed in whole numbers. The percentage of responsibility attributable to any one is not necessarily measured by the number of acts or omissions found.

For each person you found caused or contributed to cause the injury, find the percentage of responsibility attributable to each:

a. Akin Gump	100 %
b. Branscomb	0 %
c. Hamilton & Terrile	0 %
d. Gary Hamilton*	0 %

*(during the time between January 1, 1991 and April 30, 1995)

e. Plaintiffs	0 %
Total	100 %

QUESTION 9

What sum of money, if paid now in cash, would fairly and reasonably compensate Plaintiffs for their loss, if any, resulting from the negligence for which you have answered "Yes" in Question No. 7?

Do not increase or reduce the amount in your answer to this question because of your answer to any other question about damages. Do not speculate about what any party's ultimate recovery may or may not be. Any recovery will be determined by the court when it applies the law to your answers at the time of judgment. Do not include interest on any amount of damages, if any. Do not reduce your award of damages for any amount of money actually paid in settlement of Plaintiffs' litigation with the SCBA manufacturers or previous Defendants in this case. This question inquires only into the amount of money in gross, exclusive of interest, that Plaintiffs would have been awarded against the SCBA manufacturers had Plaintiffs prevailed in the infringement litigation.

Answer in dollars and cents, for damages, if any.

Answer: $72,611,397.83

QUESTION 10

From a preponderance of the evidence, do you find that Plaintiffs knew or should have known of the facts that establish their claim for malpractice against Akin Gump prior to May 28, 2001?

Answer "yes" or "no": No

May 7, 2009
Date

AMICUS
CURIAE
BRIEF

No. 13-298

RECORD
AND
BRIEFS

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON PETITION FOR A WRIT OF CERTIORARI TO THE COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICUS CURIAE* ELECTRONIC FRONTIER FOUNDATION IN SUPPORT OF GRANT OF PETITION

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BRIEF OF *AMICUS CURIAE* ELECTRONIC FRONTIER FOUNDATION IN SUPPORT OF GRANT OF PETITION

STATEMENT OF INTEREST

The Electronic Frontier Foundation ("EFF") is a non-profit civil liberties organization that has worked for more than 20 years to protect consumer interests, innovation, and free expression in the digital world. EFF and its 24,000 active members have a strong interest in helping the courts and policy-makers to strike the appropriate balance between intellectual property and the public interest. As part of its mission, EFF has often served as *amicus* in key patent cases, including *Microsoft Corp. v. i4i Ltd. P'ship, et al.*, 131 S. Ct. 2238 (2011); *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); *Quanta Computer, Inc. v. LG Elecs. Corp.*, 553 U.S. 617 (2008); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007); and *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2005).[1]

SUMMARY OF ARGUMENT

This Court has repeatedly made clear that Section 101 of the Patent Act should serve as a meaningful limit on what inventions make up patentable subject matter. Despite this Court's guidance in *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 132 S. Ct. 1289 (2012), the Federal Circuit has failed to implement a workable standard—or, frankly, any standard at all—as to what computer- and Internet-implemented inventions are patentable. The resulting legal instability has driven up the already-ballooning costs of patent litigation and has discouraged district courts from using Section 101 as a meaningful tool to slow that trend. Case in point: the *en banc* Federal Circuit fractured opinion below.

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[1] No counsel for a party authored this brief in whole or in part, and no such counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than the *amicus curiae*, or its counsel, made a monetary contribution intended to fund its preparation or submission. Pursuant to Supreme Court Rule 37.2(a), *amicus curiae* provided at least ten days' notice of its intent to file this brief to counsel of record for all parties. The parties have consented to the filing of this brief. Web sites cited in this brief were last visited on October 2, 2013.

Amicus agrees with the outcome the *en banc* Federal Circuit reached, namely that the patents at issue are impermissibly abstract, yet it writes in support of the petition for certiorari since that ruling wholly failed to provide any much-needed precedential guidance. *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1292 n.1 (Fed. Cir. 2013) (Rader, C.J., concurring and dissenting).

Indeed, that failure to provide guidance led to a wrong and dangerous ruling in *WildTangent, Inc. v. Ultramercial LLC, et al.*, No. 13-255. A petition for certiorari in that case is also currently pending before this Court; *amicus* believes that the *WildTangent* case would provide a better vehicle than this one to resolve how Section 101 applies to computer-implemented inventions. Brief of Amicus Curiae Electronic Frontier Foundation in Support of Petitioner, *WildTangent, Inc. v. Ultramercial, LLC, et al.*, No. 13-255. However, the question surrounding the scope of Section 101 needs to be addressed by this Court, and this case, too, provides an opportunity for that to happen.

Because the Federal Circuit's resulting interpretation of that *en banc* ruling conflicts with the decisions of this Court, because the decision below failed to provide any precedential guidance, because rulings from the Federal Circuit are inconsistent, and because this will negatively impact potential litigants and others affected by patent rights, this Court should grant certiorari.

ARGUMENT

Amicus is particularly concerned that there be clear and understandable boundaries for patentable subject matter under 35 U.S.C. § 101 because the rise in patent litigation has disproportionately affected the areas in which *amicus* and its members work. In the United States, for example, software patents are more than twice as likely to be the subject of a lawsuit than other patents and account for one quarter of all patent lawsuits. James Bessen & Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk* 22, 192 (2008) ("Patent Failure"). As interpreted by the Federal Circuit, Section 101 leaves parties unable to discern a patent's scope or assess its validity. As a result, the patent system fails "[i]nnovators deciding to invest in new technology [who] have to consider the risk of inadvertent infringement as a cost of doing business." James Bessen, et al., *The Private and Social Costs of Patent Trolls* 4 (Boston Univ. Sch. of Law, Working Paper No. 11-45, 2011).[2] Further, the costs associated with litigating software patents vastly exceed their benefits. Patent Failure at 143-44; *see also* Fed. Trade Comm'n, *Competition Perspectives on Sustainable Standards of*

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[2] Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272.

Patentability, in To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy ch. 4, 1 (Fed. Trade Comm'n ed., 2003)[3] ("FTC Report") (noting that patent litigation can result in millions of dollars in legal costs). These costs are only exacerbated by unclear law surrounding Section 101, which drives parties to litigate cases that might otherwise settle and blunts an otherwise powerful tool to dispose of cases at the early stages of litigation before the need to engage in expensive and lengthy discovery.

I. Innovators Need Clear Standards to Determine Patent Validity

A. The Amount of Patent Litigation Has Been Drastically Increasing, Particularly Cases Brought By NPEs and Litigation Surrounding Software Patents.

In recent years, the amount of patent litigation has dramatically increased. Chris Barry, *et al.*, PricewaterhouseCoopers, *2012 Patent Litigation Survey* 6 (2012) ("PWC 2012").[4] There were 4,015 patent actions filed in 2011, compared to fewer than 3,000 such actions filed in in 2009. *Id.* That number continues to rise; it reached 5,189 in 2012. Chris Barry, *et al.*, PricewaterhouseCoopers, *2013 Patent Litigation Survey* 6 (2013) ("PWC 2013").[5] In particular, patent cases brought by non-practicing entities (NPEs), also known as patent assertion entities (PAEs), patent monetizers, or colloquially, "patent trolls," have significantly increased. PWC 2012 at 7.

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[3] Available at http://www.ftc.gov/os/2003/10/innovationrpt.pdf.

[4] Available at http://www.pwc.com/us/en/forensic-services/publications/2012-patent-litigation-study.jhtml.

[5] Available at http://www.pwc.com/en_US/us/forensic-services/publications/assets/2013-patent-litigation-study.pdf.

NPEs accounted for only about five percent of patent litigation in 2000-2002. Bessen 2011 at 6-7. This figure increased to about 22 percent in 2007, and then to almost 40 percent in 2011. Sara Jeruss, Robin Feldman & Joshua Walker, *The America Invents Act 500: Effects of Patent Monetization Entities on US Litigation*, 11 Duke L. & Tech. L. Rev 357, 361, 381 (2012).[6] In 2012, *sixty-one percent* of new patent actions were brought by NPEs. Colleen V. Chien, *Patent Assertion Entities*, presentation to the December 10, 2012 DOJ/FTC Hearing on PAEs, slides 23-24.[7]

As Judge Posner of the Seventh Circuit put it, NPEs "are companies that acquire patents not to protect their market for a product they want to produce—patent trolls are not producers—but to lay traps for producers, for a patentee can sue for infringement even if it doesn't make the product that it holds a patent on." Richard A. Posner,

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[6] Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2158455.

[7] Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2187314. As slide 24 points out, because of the September 2011 passage of the America Invents Act, the 2011-2012 figures might be somewhat inflated. There has still been a drastic increase since five years ago.

A recent study by the General Accounting Office suggests that the percentage of new patent actions filed by NPEs is much lower. The discrepancy would appear to be due to a different definition of NPE (a much narrower definition in the GAO's case).

Why There Are Too Many Patents in America, The Atlantic (July 12 2012).[8] Chief Judge Randall Rader of the Federal Circuit has stated that "[t]he onslaught of litigation brought by 'patent trolls'... has slowed the development of new products, increased costs for businesses and consumers, and clogged our judicial system." Randall R. Rader, Colleen V. Chien, David Hricik, *Make Patent Trolls Pay in Court*, The New York Times (June 7, 2013).[9]

Patent trolls have even garnered a mention from President Obama, who stated that NPEs "don't actually produce anything themselves" and instead "leverage and hijack" the ideas of others to "see if they can extort some money out of them." Mike Masnick, *President Obama Admits That Patent Trolls Just Try To 'Extort' Money; Reform Needed*, TechDirt (February 14, 2013).[10]

Not coincidentally, the rise in NPE litigation has mirrored a rapid increase in litigation involving software patents. James Bessen, *A Generation of Software Patents* 19 (Boston Univ. School of Law, Working Paper No. 11-31, 2011).[11] One study has found that between 2007 and 2011,

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[8] Available at http://www.theatlantic.com/business/archive/2012/07/why-there-are-too-many-patents-in-america/259725/.

[9] Available at http://www.nytimes.com/2013/06/05/opinion/make-patent-trolls-pay-in-court.html.

[10] Available at https://www.techdirt.com/articles/20130214/14351821988/president-obama-admits-that-patent-trolls-just-try-to-extort-money-reform-needed.shtml.

[11] Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1868979.

46 percent of patent lawsuits involved software patents, accounting for 89 percent of the increase in the number of patent defendants during this timeframe. United States Government Accountability Office, *Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality*, 22 (2013) ("GAO Report").[12]

B. Patent Litigation Imposes a Disproportionate Burden on Technology Firms, Especially Small Innovators.

This explosion of litigation has been costly. According to a congressional study, NPEs activity cost defendants and licensees $29 billion in 2011, a 400 percent increase over $7 billion in 2005, and the losses are mostly deadweight, with less than 25 percent flowing to innovation and at least that much going towards legal fees. Brian T. Yeh, Cong. Research Serv., R42668, *An Overview of the "Patent Trolls" Debate*, at Summary and 2 (2012) ("Yeh")[13] (citing James Bessen & Michael Meurer, *The Direct Costs from NPE Disputes* 2, 18-19, (Boston Univ. School of Law, Law and Economics Research Paper No. 12-34, 2012) ("Bessen 2012")).[14] The research shows that that "NPE lawsuits are associated with half a trillion dollars of lost wealth to defendants from 1990 through 2010. During the last four years the lost wealth has averaged over $80 billion per year." Bessen 2011 at 2.

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[12] Available at http://www.gao.gov/assets/660/657103.pdf.

[13] Available at https://www.eff.org/sites/default/files/R42668_0.pdf.

[14] Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2091210.

And, in what has become a theme, the high-tech industry bears a large percentage of the costs. As the congressional study noted:

> Experts attribute the proliferation of PAEs over the past 10 to 15 years to the explosion of the information technology (IT) industry and patent law's struggle to adapt to the unique issues presented by this new frontier of innovation. They indicate that the PAE business model is not about licensing patents generally but *high-tech* patents in particular, including those on software and business methods or processes related to software, as well as computers and electronics.

Yeh at 9 (footnotes omitted). Several technology companies have publicly reported that they have increasingly become the subject of patent litigation lawsuits by NPEs in the last ten years. *See, e.g.,* GAO Report at 16.

The litigation explosion particularly burdens small companies, which often find themselves the targets of these suits. One study has found that nearly 75 percent of venture capitalists have had their portfolios impacted by litigation from a patent troll. Colleen Chien, *Patent Assertion and Startup Innovation*, New America Foundation (Sept. 2013) at 10.[15] More than half of the defendants involved in litigation brought by patent NPEs are companies with annual revenues of $10 million or less. *Id.* at 11. Litigation-based legal expenses can kill small startups entirely, and the mere threat of those expenses can chill innovation. In a small company, key management and engineers must deal with an NPE claim. Colleen Chien, *Startups and Patent Trolls* 10-13 (Santa Clara Univ. School of Law, Legal Studies Research Paper Series, Accepted Paper No. 09-12, 2012).[16] Professor Chien noted:

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[15] Available at http://www.newamerica.net/publications/policy/patent_assertion_and_startup_innovation.

> Although large companies tend to dominate patent headlines, most unique defendants to PAE suits are small. Companies with less than $100M annual revenue represent at least 66% of unique defendants and the majority of them make much less than that: at least 55% of unique defendants in PAE suits make under $10M per year. Suing small companies appears [to] distinguish PAEs from operating companies, who sued companies with less than $10M of annual revenue only 16% of the time, based on unique defendants.

Id. at 1-2. This results in small cash-poor companies becoming vulnerable targets that lack leverage to deal with an NPE claim, leaving them stuck paying nuisance settlements regardless of the merits of the underlying claim. *Id.* at 3. With small- and medium-sized companies making up 90 percent of the defendants in NPE suits, Bessen 2012 at 11, such nuisance settlements are widespread.

In another troubling trend, small companies increasingly find themselves targeted by NPEs based on their use of basic technologies, such as using a scanner or wireless Internet. Joe Mullin, *Patent Trolls Want $1,000—For Using Scanners*, Ars Technica (Jan. 2, 2013) (stating "2012 may go down as the year of the user").[17] One analysis has found that the top ten patent litigation campaigns over the past three years (as determined by number of named defendants) all involved users and implementers of a technology. Chien, *Patent Assertion and Startup Innovation* at 12. Small companies are particularly vulnerable to such lawsuits, as they are unlikely to have been able to negotiate indemnity protection. *Id.* at 13.

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[16] Available at http://ssrn.com/abstract=2146251.

C. Innovators Should Have the Ability to Obtain Prompt Disposal of Unmeritorious Suits, Particularly at Early Stages of Litigation.

This inability to discern a patent's scope or assess its validity leads to two distinct unfortunate results: (1) it drives parties to litigate cases that might otherwise fairly settle; and/or (2) it encourages parties to accept settlements that do not reflect the merits of the case. Thus, the present state of confusion surrounding Section 101 blunts an otherwise powerful incentive to dispose of cases at the summary judgment stage (or earlier), before the need to engage in expensive and lengthy discovery.

Widespread agreement exists that the harm from NPEs outweighs any benefit they provide. Yeh at Summary, 2, 6. Despite this, there is an apparent lack of consensus as to the best way to fix the problem. One crucial way to stem abuse by NPEs is to create incentives for those facing litigation (or litigation threats) to pursue their meritorious defenses of noninfringement and invalidity. *Id.* at 5 (citing John R. Allison, Mark A. Lemley & Joshua Walker, *Patent Quality and Settlement Among Repeat Patent Litigants*, 99 Geo. L.J. 677, 694 (2011)[18] ("Studies suggest that [non-practicing entities] rarely prevail on the merits. Their win rate in cases decided on the merits is just 8 percent, versus 40 percent for other entities . . . . But they persist with litigation nonetheless, apparently supported by the licensing fees obtained by posing a credible threat of extended litigation.").

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[17] Available at http://arstechnica.com/tech-policy/2013/01/patent-trolls-want-1000-for-using-scanners.

Indeed, the most troubling aspect of the NPEs' business model—leveraging the cost of litigation to secure settlements in weak cases—is deterred by additional opportunities to appropriately dispose of cases at the early stages of litigation. Moreover, the ability to address Section 101 issues at early stages of litigation will not harm the rights of any non-practicing entity (or of any plaintiff) who attempts to enforce a patent that is non-abstract.

Thus, several cases have properly decided Section 101 issues at an early stage, either by summary judgment or on a motion to dismiss. *See, e.g.*, *Bancorp Servs., L.L.C. v. Sun Life Assurance Co.*, 687 F.3d 1266, 1273-74 (Fed. Cir. 2012); *OIP Techs., Inc. v. Amazon.com, Inc.*, No. C-12-1233 EMC, 2012 WL 3985118 (N.D. Cal. Sept. 11, 2012); *Glory Licensing, L.L.C. v. Toys "R" Us, Inc.*, Case No. 09-4252 FSH, 2011 WL 1870591 (D. N.J. May 16, 2011); *Uniloc USA, Inc. v. Rackspace Hosting, Inc.*, 12-CV-375 (E.D. Tex. March 27, 2013); *Cyberfone Systems, LLC v. Cellco P'ship, et al.*, C.A. No. 11-827-SLR through 11-835-SLR

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[18] Available at: http://georgetownlawjournal.org/files/pdf/99-3/AllisonLemleyWalker%20677-712.PDF.

(D. Del. Aug. 16, 2012). This trend should be encouraged, and this case serves as a proper vehicle to do just that.

II. The Federal Circuit's Interpretation—or Lack Thereof—of Section 101 Threatens Innovation by Failing to Provide Clear Guidance.

Section 101, which defines what subject matter that may be patented, serves as the primary threshold to limit the grant of exclusive rights where those rights are unnecessary and harmful. *See* 35 U.S.C. § 101.

Or it should. In *Mayo v. Prometheus,* this Court unanimously "decline[d] . . . to substitute §§ 102, 103, and 112 inquiries for the better established inquiry under § 101." 132 S. Ct. at 1304 (rejecting the argument that §§ 102, 103, and 112 could perform § 101's "screening function"). Otherwise, "to shift the patent-eligibility inquiry entirely to these later sections risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do." *Id.*

Indeed, this Court has now made clear, time and again, that Section 101 serves a crucial function in patent eligibility. And not just any function. The "cases have endorsed a bright-line prohibition against patenting laws of nature, mathematical formulas and the like." *Mayo,* 132 S. Ct. at 1303. The three exceptions to patentability under Section 101 "have defined the reach of the statute as a matter of statutory *stare decisis* going back 150 years." *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010). "As the Court has explained, without this exception, there would be considerable danger that the grant of patents would 'tie up' the use of such tools and thereby 'inhibit future innovation premised upon them.'" *Assoc. for Molecular Pathology v. Myriad Genetics,* 133 S. Ct. 2107, 2116 (2013) *citing Mayo,* 132 S. Ct. at 1301.

The threshold question of abstractness serves as an important check on inventions that could "pre-empt use of [an abstract] approach in all fields, [] . . . effectively grant[ing] a monopoly over an abstract idea." *Bilski* at 3231. In *Bilski,* this Court made clear that it is more important now than ever to ensure that this bar to patentability remains high:

> The Information Age empowers people with new capacities to statistical analyses and mathematical calculations with a speed and sophistication that enable the design of protocols for more efficient performance of a vast number of business tasks. If a high enough bar is not set when considering patent applications of this sort, patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change.

Id. at 3229.

A high bar to patentability likewise places the burden of understanding the technology on those who know it best: the patent applicants and the patent examiners. Indeed, as this Court reminded us in *Mayo*:

> Courts and judges are not institutionally well suited to making the kinds of judgments needed to distinguish among different laws of nature.

> And so the cases have endorsed a bright-line prohibition against patenting laws of nature, mathematical formulas and the like.

Mayo, 132 S. Ct. at 1303.

Despite this clear guidance, the Federal Circuit has repeatedly failed to implement a clear and effective Section 101 standard. Even worse, its attempts to do so have only further muddied the waters, leaving litigants with virtually no guidance on what is and is not patentable subject matter. When the *en banc* Federal Circuit below was presented with the question of what test it should adopt to determine if an invention is an abstract idea, it wholly failed to come up with an answer. *CLS Bank*, 717 F.3d at 1277, 1282-84.

This was despite the pleas from many judges for clear Section 101 guidelines. *See, e.g.*, *id.* at 1277 (Lourie, J., concurring) ("What is needed is a consistent, cohesive, and accessible approach to the Section 101 analysis—a framework that will provide guidance and predictability for patent applicants and examiners, litigants, and the courts."); *id.* at 1314 (Moore, J., dissenting) ("Our court is irreconcilably fractured over these system claims and there are many similar cases pending before our court and the district courts."); *id.* at 1321 (Newman, J., concurring and dissenting) ("Today's irresolution concerning section 101 affects not only this court and the trial courts, but also the PTO examiners and agency tribunals, and all who invent and invest in new technology. The uncertainty of administrative and judicial outcome and the high costs of resolution are a disincentive to both innovators and competitors.").

III. *WildTangent v. Ultramercial* Is A Better Vehicle to Decide These Issues.

Twelve days before Alice Corp. filed its petition for certiorari in this case, WildTangent filed a petition for certiorari in the *Ultramercial* case. *See* Sup. Ct. Docket No. 13-255. Preferably, the Court should grant the petitions in both cases, hear consolidated oral argument, and issue coordinated opinions. This will provide the most guidance to the public and to the Federal Circuit.

However, the Court might be inclined to grant the petition in only one of the two cases, while holding the other case pending the decision of the granted case, and then grant certiorari, vacate, and remand ("GVR") the other case. If the Court is so inclined, then *WildTangent* is a better vehicle to decide the issues than is this case for several reasons, both procedurally and substantively.

First, *CLS Bank* is not precedential. *CLS Bank*, 717 F.3d at 1292 n.1 (concurring and dissenting opinion of Chief Judge Rader, n.1). By contrast, *WildTangent* is precedential, and will remain a dangerous precedent unless and until certiorari is actually granted.

Second, *WildTangent* has already been through the GVR process. Indeed, it presents a nearly identical procedural history as in *Mayo*. There, the District Court invalidated Mayo's patents, holding they claimed laws of nature or natural phenomena. *Prometheus Labs. Inc. v. Mayo Collaborative Servs.*, Case No. 04-1200, 2008 WL 878910, at *7 (S.D. Cal. Mar. 28, 2008). A panel of the Federal Circuit reversed, relying on the "machine or transformation test." 581 F.3d 1336, 1345-47 (Fed.

Cir. 2009). Mayo filed a petition for certiorari; this Court granted it, vacated the judgment, and remanded in light of *Bilski*. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 130 S. Ct. 3543 (2010). Upon remand, the Federal Circuit merely reaffirmed its earlier ruling. 628 F.3d 1347, 1355 (2010). Mayo again petitioned for certiorari and this Court unanimously reversed. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012).

Likewise, in *WildTangent*, the District Court invalidated the patent at issue, holding that as an abstract idea, it did not cover patentable subject matter. *Ultramercial, LLC v. Hulu, LLC*, No. CV 09-06918, 2010 WL 3360098 (C.D. Cal. Aug. 13, 2010). The Federal Circuit reversed, holding the patent valid simply because "invention involves an extensive computer interface." *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1328 (Fed. Cir. 2011). WildTangent filed a petition for certiorari, which this Court granted, while vacating the ruling and remanding it in light of the recent *Mayo v. Prometheus* ruling. *WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012). The Federal Circuit panel again merely reaffirmed its first ruling, holding that Ultramercial's patent claims a "practical application" of an abstract idea. *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1353 (Fed. Cir. 2013).

WildTangent asked this Court to hear the matter again. Respectfully, we agree. Should the Court grant certiorari only in this case and use the GVR procedure again for *WildTangent*, there is no guarantee that the Court will not see *WildTangent* for a *third* time—the Federal Circuit might well misapply the Court's *Alice Corp.* opinion and require yet another certiorari petition in *WildTangent.* In contrast, granting certiorari in *WildTangent* and issuing a definitive opinion will dispose of that case, while the subsequent (and first) GVR in *Alice Corp.* might well result in a less fractured Federal Circuit on remand.

Finally, *WildTangent* is a better substantive vehicle on the merits. It involves recurring issues related to whether adding "the Internet" or "a computer" to an abstract idea results in patentable subject matter. It involves computer-related subject matter rather than *Alice Corp.'s* business methods. *WildTangent* is thus more representative of the patents harming innovators today. *See* Section I above. Further, unlike here, *WildTangent* asks whether Section 101 issues can be decided on a motion to dismiss—an important procedural tool to dispose of improperly granted patents. *See* Section I.C. above.

Finally, amicus believes that the Federal Circuit's judgment invalidating the patents here was correct, but supports Alice Corp.'s petition for certiorari so the Court can affirm based on sound precedential reasoning. This case is important, but less urgently requires this Court's attention than does *WildTangent.*

CONCLUSION

This Court should grant petitions for a writ of certiorari in both this case and in *WildTangent v. Ultramercial,* No. 13-255. If the Court only grants certiorari in one, *amicus* respectfully urges that it be in *WildTangent.* However, due to the importance of the questions surrounding Section 101, *amicus* believes that any vehicle to raise the matter is better than ignoring the morass the Federal Circuit has created. As such, it files this brief in support of the petition for certiorari in this case.

Dated: October 4, 2013

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In The
Supreme Court of the United States

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ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, ET AL.,

Respondents.

◆

**On Petition For Writ Of Certiorari
To The United States Court Of Appeals
For The Federal Circuit**

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BRIEF OF *AMICUS CURIAE* GIBBONS INSTITUTE OF LAW, SCIENCE AND TECHNOLOGY IN SUPPORT OF NEITHER PARTY

◆

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STATEMENT OF INTEREST OF *AMICUS CURIAE*[1]

Amicus Curiae Gibbons Institute of Law, Science & Technology is an academic center at Seton Hall University Law School. The Institute provides a forum for lawyers, judges, scientists, and government officials to discuss the legal, political and social problems that will continue to arise as scientific and technological changes challenge our existing laws and legal institutions. The Institute is directed by Seton Hall Law School intellectual property faculty and is led by an Advisory Board consisting of intellectual property attorneys working in the pharmaceutical, biotechnology, computer, telecommunications, and medical device industries, as well as intellectual property attorneys in private practice. The Institute is interested in promoting sound intellectual property policy in order to maximize the creation and diffusion of new technologies.

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[1] No party or counsel for a party authored or contributed monetarily to the preparation or submission of any portion of this brief. The parties have filed blanket waivers consenting to the filing of this brief, and have agreed to waive their rights to receive notice of the Institute's intention to file this *Amicus Curiae* brief 10 days in advance of filing, as provided under paragraph 2(a) of Sup. Ct. R. 37. Letters reflecting such consent have been filed with the Court.

SUMMARY OF ARGUMENT

The multiplicity of opinions in the Federal Circuit's *en banc* review of this case demonstrate that the current law concerning the patentability of computer-implemented inventions is unsettled. Legal certainty is important if patents are to serve as an incentive to innovation and to innovation disclosure in consonance with Art. I, Sec. 8, Cl. 8 of the U.S. Constitution.

The Court in *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974) acknowledged that trade secrecy operates to curtail innovation disclosure, but suggested that innovators would not be unduly discouraged from electing to make patent disclosures in lieu of trade secrecy in cases where the innovations are believed to be "clearly patentable." *See*, *e.g.*, *Kewanee Oil*, 416 U.S. at 489-91. The decision whether to disclose innovation by patent or keep them secret necessarily involves some *ex ante* calculation about patentability.

If the basic standard for determining the patentability of computer-implemented inventions remains unsettled, diffusion of associated technologies via patent licensing markets undoubtedly will be disrupted. Moreover, while the standard is unsettled, aggressive patent assertion activities involving computer-implemented inventions of questionable patentability will continue to exact significant and unnecessary economic costs.

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ARGUMENT

I. The Multiple Opinions in the Federal Circuit's *CLS Bank* Decision Undermine the Fundamental Principle of Legal Certainty, Which is Particularly Important in Patent Policy

The *Amicus* agrees with Petitioner that this case presents a fundamental and important issue of patent law that warrants this Court's attention. The Petition accurately recounts the confusing and conflicting multiplicity of opinions in the Federal Circuit's *en banc* review of this case. As Petitioner notes, "[t]he Federal Circuit has left no doubt that it is now irreconcilably fractured" concerning the patentability of computer-implemented inventions. Petition, at 3.

It is a basic principle of jurisprudence that if the law is to guide conduct, it must provide some degree of certainty concerning what is prohibited or permitted, encouraged or discouraged. *See* Kelly Casey Mullally, *Legal (Un)Certainty, Legal Process, and Patent Law*, 43 LOY. L.A. L. REV. 1109, 1112 (2010) (stating that "[c]ertainty, in terms of predictability of results, is necessary to view law-making institutions as legitimate sources of authority"). This basic principle is particularly apt in patent law. Patents promote innovation because they reward invention and discovery with an exclusive economic right. That, at least, is the reason the Constitution invested Congress with the power to create a patent statute. *See* U.S. Const. Art. I, Sec. 8, Cl. 8. Patents also promote disclosure of inventions to the public. *See*, *e.g.*, *Brenner v. Manson*, 383 U.S. 519, 533-34 (1966) (stating that "one of the purposes of the patent system is to encourage dissemination of information concerning discoveries and inventions"); *Universal Oil Prods. Co. v. Globe Oil & Ref. Co.*, 322 U.S. 471, 484 (1944) (stating that "[a]s a reward for inventions and to encourage their disclosure, the United States offers a seventeen-year monopoly to an inventor who refrains from keeping his invention a trade secret."). But the patent system will only work if prospective inventors have some idea about what can be patented. Without some degree of *ex ante* certainty, a patent system will only serve as a barrier to innovation and a drain on the economy.

First, legal certainty is important if the prospect of a patent is to serve as an incentive to innovation. If the basic question of whether a technology represents patentable subject matter remains unsettled, individuals, firms, and investors may hesitate to pour resources into that technology. At the very least, any resources devoted to that technology will be deployed *in spite of* the patent system and not at all *because* of it. In contrast, if it is clear that a technology at least falls within the contours of patentable subject matter, the patent system may serve as a motivation for allocating resources towards that technology. *See* Justus Baron et al., *Essential Patents and Standard Dynamics*, Northwestern University Law School Working Paper, March 2013, available at http://www.law.northwestern.edu/faculty/programs/searlecenter/events/entrepreneur/

documents/Baron_Pohlmann_Blind_Essential_Patents_Standard_Dynamics.pdf.

Second, legal certainty is important if the prospect of a patent is to serve as an incentive to disclosure. The traditional alternative to patent protection is trade secrecy. The traditional view is that an inventor will disclose his or her invention if the potential value of a patent exceeds the value of keeping the invention secret. *See, e.g.*, *Kewanee Oil*, 416 U.S. at 481.

The *Kewanee* Court discussed at length the relationship between trade secrets and patents. With respect to "clearly unpatentable" inventions or information, the Court suggested that trade secret protection plays a useful gatekeeping function by helping to keep the patent office from becoming overwhelmed. *Id.* at 485. The Court believed that trade secret protection for inventions that are "clearly patentable" does not unduly discourage inventors from making patent disclosures. *Id.* at 489-91. The Court reasoned that patents provide stronger protection than trade secrets and that patent law's statutory bars pressure inventors to seek patent protection for potentially valuable inventions. *Id.* As for trade secrets concerning inventions of "questionable" patentability, the Court suggested that the inventor can gauge the risks as between the competing alternatives of secrecy and patent disclosure *Id.* at 487-88.

If the *Kewanee* Court's observations concerning the relationship between trade secrecy and patent disclosures are to retain any purchase at all, there must be some possibility of determining when something is "clearly unpatentable" or "clearly patentable." If *all* inventions fall into the "questionable" category, the gatekeeping and incentive functions of the patent law discussed by the *Kewanee* Court will dissolve. Even the *Kewanee* Court's "questionable" category presumes some stable principles upon which the odds of successfully prosecuting a patent claim could be at least roughly assessed.

Indeed, it is already the case that the decision whether to disclose or keep secret is often far more complex than the traditional view suggests. *See generally* David W. Opderbeck, *Social Network Analysis of Trade Secrets and Patents as Social Relations*, 43 A.I.P.L.Q. 1 (2013) (forthcoming); Douglas Lichtman et al., *Strategic Disclosure in the Patent System*, 53 VAND. L. REV. 2175, 2179 (2000) (discussing the incentives for strategic disclosure for both firms that are trailing and those leading in a given patent race); Gideon Parchomovsky, *Publish or Perish*, 98 MICH. L. REV. 926, 927 (2000) (discussing strategic publication of research findings). Recent articles on strategic disclosures demonstrate that possessors of information might choose to publish portions of information for strategic reasons. *See* Oren Bar-Gill & Gideon Parchomovsky, *The Value of Giving Away Secrets*, 89 VA. L. REV. 1857, 1860-61 (2003); Scott Baker & Claudio Mezzetti, *Disclosure as a Strategy in the Patent Race*, 48 J.L. & ECON. 173, 177, 189 (2005). This can occur, for example, when cumulative innovations are developed over time and combined to form a patentable invention. Bar-Gill at 1860-61. Early innovators might not be in a position *ex ante* to make the investment needed to develop all the technology necessary for the final, patentable invention. *Cf. id.* at 1858 ("The ex post perspective . . . presumes the existence of the cumulative invention – an existence which cannot be taken for granted. Generally, the cumulative inventor would need to sink substantial development costs before she can approach the original inventor and bargain for a license."). Under such circumstances, an early innovator might decide to publish his discrete findings in the hope that a later inventor will combine them with other findings to produce a cumulative invention. *Cf. id.* at 1861 ("Moreover, publication has the salutary effect of blazing the trail for cumulative innovators. Publication of certain aspects of a discovery may provide the impetus for subsequent improvements of the original invention.").

In either case – whether under the traditional view or under more economically subtle contemporary views – the decision whether to disclose or keep secret involves some *ex ante* calculation about patentability. If the basic standard for patentable subject matter remains undefined, any such calculation will be thrown into utter confusion.

Finally, legal certainty is important if patents are to serve as vehicles for the exchange of technology through licensing. Ideally, patents encourage the *diffusion* of technology by defining rights that establish licensing markets. As the U.S. Federal Trade

Commission and Justice Department's Antitrust Guidelines for the Licensing of Intellectual Property note,

> Licensing, cross-licensing, or otherwise transferring intellectual property (hereinafter "licensing") can facilitate integration of the licensed property with complementary factors of production. This integration can lead to more efficient exploitation of the intellectual property, benefiting consumers through the reduction of costs and the introduction of new products. Such arrangements increase the value of intellectual property to consumers and to the developers of the technology. By potentially increasing the expected returns from intellectual property, licensing also can increase the incentive for its creation and thus promote greater investment in research and development.

U.S. Department of Justice, Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property*, April 6, 1995, available at http://www.justice.gov/atr/public/guidelines/0558.htm#t23. Licensing is particularly important in the computer and consumer technology industries, where there are often multiple patents covering discrete methods, devices, and processes. Under these circumstances, groups of related patents sometimes are combined into patent pools that facilitate the adoption of common technological standards and support related markets. For example, the "One-Blue" patent pool aggregates and licenses patents essential to the Blu-Ray home video technology. *See, e.g.*, One-Blue, *One-Blue*

License Programs, 2011, available at http://www.one-blue.com/. Participants in the One-Blue pool include Philips, Sony, Hitachi, Samsung, Cyberlink, Dell, Fujitsu, JVC Kenwood, Hewlett-Packard, LG Electronics, Pioneer, Sharp, Taiyo Yuden and Yamaha. *See* Columbia Technology Ventures, *One-Blue Patent Pool Seeks to Enforce Blu-Ray, Other IP*, available at http://techventures.columbia.edu/news/one-blue-patent-pool-seeks-enforce-blu-ray-other-ip. Patent pools facilitated the growth of the sewing machine, aircraft, radio, and DVD industries. *See* U.S. Patent & Trademark Office, *Patent Pools: A Solution to the Problem of Access in Biotechnology Patents?*, December 5, 2000, at 4-5, available at http://www.uspto.gov/web/offices/pac/dapp/opla/patentpool.pdf. If the basic standard for patentable subject matter remains undefined, licensing markets also will become hopelessly confused and the economic benefits noted in the FTC-DOJ Licensing Guidelines will rarely be realized.

The need for certainty in licensing markets is particularly acute with respect to computer-implemented inventions because of a trend not noted in the FTC-DOJ Guidelines: the phenomenon of "patent assertion entities" or "patent trolls." The President's Council of Economic Advisors recently issued a report on this issue, which noted that "[s]ome firms that own patents but do not make products with them play an important role in U.S. innovation ecosystem, for example by connecting manufacturers with inventors, thereby allowing inventors to focus on what they do best." Executive Office of the President, *Patent Assertion and U.S. Innovation* (June 2013), at 1, available at http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf. That Report also argued, however, that some non-practicing patent assertion entities have engaged in excessively aggressive litigation tactics, particularly over software patents, which have hindered innovation. The Report notes that "[b]ecause of rapid technological change and the special characteristics of software, it has been hard to define clear boundaries for patents, and hard to set an appropriate bar for non-obviousness." *Id.* at 2. Based on this Report, the Obama Administration issued a set of Executive Actions designed to limit some of the activities of these entities. *See* The White House, *White House Task Force on High-Tech Patent Issues (Fact Sheet)*, June 4, 2013, available at http://www.whitehouse.gov/the-press-office/2013/06/04/fact-sheet-white-house-task-force-high-tech-patent-issues.

The lack of clear standards from the Federal Circuit for the patentability of computer-implemented inventions further muddies the waters of this already clouded debate. It is impossible even to begin to ascertain the line between economically useful patent licensing intermediaries and predatory patent "trolls" if the basic question of patentability under Section 101 remains so hopelessly confused. The importance of this issue alone suggests that the Court should clarify whether, and to what extent, computer-implemented inventions are patent eligible subject matter.

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CONCLUSION

Alice Corporation's petition for a writ of certiorari should be granted.

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AND
BRIEFS

No. 13-298

In The
Supreme Court of the United States

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ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

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ON PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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BRIEF OF AMICUS CURIAE PROFESSOR LEE HOLLAAR AND PETER K. TRZYNA IN SUPPORT OF NEITHER PARTY

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Statement of Interest of *Amicus Curiae*[1]

Lee A. Hollaar is a professor of computer science in the School of Computing at the University of Utah, teaching courses in computer and intellectual property law and computer systems and networking. Programming computers since 1964 and designing computer hardware since 1969, he received his B.S. degree in electrical engineering from the Illinois Institute of Technology in 1969 and his Ph.D. in computer science from the University of Illinois at Urbana-Champaign in 1975. Prof. Hollaar was a Fellow with the Senate Committee on the Judiciary and technical advisor to its chair, Senator Hatch, and a visiting scholar with Judge Randall R. Rader at the Court of Appeals for the Federal Circuit.

As an inventor and patentee of computer-implemented technology, a Registered Patent Agent involved with the prosecution of patent applications since 1989, an expert witness and special master in patent litigation, the author of *Legal Protection of Digital Information* (BNA Books, 2002) and course material on patenting computer-implemented technology, and teacher of that material, Prof. Hollaar is concerned that the decision in this appeal might continue the unclear lines of what is statutory subject matter by making distinctions untethered to real technological differences or perpetuate inventors of computer-program-based inventions to claim them in ways that obscure the patentable advance over the prior art. Having taught patent law to computer science and engineering students for almost two decades, he has seen how the disconnect between the current computer statutory subject matter distinctions and the realities of the technology leaves even the Federal Circuit, sitting en banc, unable to apply the current tests, to the determent of innovators (especially in software startups) and the entire patent system.

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[1] In accordance with Supreme Court Rule 37.6, counsel listed on the cover states that this brief was authored by amicus curiae Professor Hollaar and Peter K. Trzyna, and that counsel to a party did not author this brief in whole or in part. No person other than the amici curiae and their counsel made a monetary contribution to the preparation or submission of this brief. Petitioners and Respondent have consented to the filing of this brief and their consents have been filed with the Court.

Peter K. Trzyna has been a Registered Patent Attorney since 1984, and is a member of the Illinois, New York, D.C., Federal Circuit, and Supreme Court bars. He has been doing patent prosecution for over 25 years, including as an attorney at Kenyon & Kenyon; Cadwalader, Wickersham & Taft; and Baker & McKenzie, where he was a partner in the Chicago office, prior to establishing his own law firm. Mr. Trzyna has a B.S., M.A., J.D., and M.S. in Engineering and Applied Physical Science, all from the University of Wisconsin. A joint inventor in fourteen patents and numerous pending patent applications, most of which are software-related, Mr. Trzyna also is the managing partner of Windy City Technology, a plaintiff in a successful patent infringement litigation. He has been extensively quoted in the *Wall Street Journal*, *New York Times*, *Economist*, *Washington Post*, and has co-authored articles directed to whether patent law makes technological sense. Having obtained hundreds of patents and had many enforced, he has seen technologically unsound USPTO rejections and courts mired in trying to make sense of the intersection of computer science and patent law.

The views expressed here are solely those of Professor Lee Hollaar and Peter K. Trzyna.

Summary of the Argument

Over four decades since this Court finally found an acceptable method claim for such an invention, lower courts are still trying to find where to draw the line. But though many consider this Court's *Benson*[2]-*Flook*[3]-*Diehr*[4] trilogy of decisions, recently confirmed by this Court in *Bilski*,[5] confusing and contradictory. However, there is a simple, bright-line test for statutory subject matter that reconciles them, as revealed by original research into the Benson decision presented herein.

Rather than dismissing patentability based on characterizations of claimed computer-implemented inventions, this Court should grant certiorari to this case to draw clear Sec. 101 lines that that are understandable and simple to apply because they are firmly supported by technology and are in accord with its past opinions, thereby placing the focus on the other patentability requirements (novelty, non-obviousness, commensurate disclosure) to solve today's problems with patents on computer-implemented inventions.

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[2] *Gottschalk v. Benson*, 409 U.S. 63 (1972).

[3] *Parker v. Flook*, 437 U.S. 584 (1978).

[4] *Diamond v. Diehr*, 450 U.S. 175 (1981).

[5] *Bilski v. Kappos*, 561 U.S. ___ (2010).

Introduction

Computer technology has expanded well beyond the use of an expensive digital computer to control an industrial process, when this Court first considered the patentability of computer-implemented inventions more than a four decades ago, to being seemingly omnipresent. Microwave ovens, washers and dryers, television sets and radios, thermostats, furnaces and boilers, sprinkler controllers, and clocks and watches are but a few of the appliances where an embedded computer has replaced mechanical timers, gears, and switches, resulting in more reliable products able to perform more functions at lower prices.

To exclude inventions from possible patent protection merely because they are computer-implemented would ignore today's information age revolution and relegate the United States patent system to the 19th century, where the only patentable processes were those that transform or reduce an article to a different state or thing.[6]

When is an idea "abstract"?

This Court has repeatedly held that laws of nature, physical phenomena, and abstract idea are judicially-made exceptions to the statutory subject matter categories of 35 U.S.C. § 101. While the first two categories are generally-understood, there is much confusion about when an invention is "abstract," especially regarding computer-implemented inventions.

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[6] *Cochran v. Deener*, 94 U.S. 780.

One of the problems with this Court's use of the term "abstract" to describe when an invention is not patentable is that "abstract" is not a term used in computer technology.[7] However, there *is* a bright line that can be drawn between "abstract" and statutorily patentable that is a clear distinction in computer technology as well as being in complete accord with the past Supreme Court decisions.

The dictionary definition of "abstract" is a clear and simple test

The first non-archaic definition for "abstract" in *Webster's Third New International Dictionary* is:

> considered apart from any application to a particular object or specific instance; separated from embodiment.[8]

This simple, dictionary definition is in accord with all this Court's Sec. 101 decisions, particularly those involving computers. In *Flook*, the claimed method held to be unpatentable is not tied to any particular embodiment, and particularly is not limited to performing the method using a computer at all. The claimed computation of the alarm limit could be done by hand. In contrast, the patentable method claimed in *Diehr* is explicitly tied to a digital computer, both in the preamble and in the claim element that requires "providing said computer with a data base for said press." Similarly, the claims found unpatentable in *Bilski* do not require that they be embodied on a computer.

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[7] Professor Hollaar has taught computer programming and hardware design since receiving his Ph.D. in computer science in 1975, and has been programming computers since 1964, and does not remember ever encountering the term used in the context that this Court has used the term.

[8] The third definition seems more fitting for all the confusion that has resulted from using a non-technical term: "difficult to understand."

Our research shows that Benson is in accord with this clear and simple test for when a claimed method is an "abstract idea"

Benson might appear to contradict this clear test, because while claim 13 is not tied to any embodiment, and therefore unpatentable, claim 8 requires a "reentrant shift register" and yet was also found unpatentable by this Court.

However, this seeming-divergence can be understood by considering the prosecution history of the Benson application,[9] which disclaimed any computer limitation. On page 7 of Benson's response to the first office action (page 23 of the prosecution history), Benson's attorney states "Finally, the method represented by these claims *can also be*

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[9] Because a patent did not issue from Benson's application, the prosecution history is not public. However, the complete prosecution history was filed with the CCPA as a "Transcript of Record" in the case. That was also forwarded by the CCPA to the Supreme Court when Cert. was granted. A copy of the Transcript of Record stored with other Supreme Court documents at the National Archives, is available at http://digital-law-online.info/papers/lah/BensonAppendix.pdf.

carried out by hand, the shifting and adding being manual." (Emphasis added.) The "claims" referred to include both 8 and 13 in essentially the same form as considered by this Court. Further, on page 24 of the prosecution history, Benson's attorney reiterates

> Concededly, applicants' methods *can* be implemented by a set of instructions which are used to control the operation of a computer. As noted above, they can also be implemented by circuitry which is wired to perform the function. They can even be practiced by hand.[10]

In light of the prosecution history, what was claimed in *Benson* is an abstract method like the one in *Flook*, not tied to any embodiment and certainly not to a digital computer.

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[10] Emphasis in the original. Benson's attorney made those critical admissions because he felt the law at the time was that if a method could be carried out by hand, the invention was no longer "mental steps" and was therefore statutory subject matter.

The CCPA ignored the applicant's admission that "reentrant shift register" refers to a particular operation that can be "practiced by hand," instead substituting a definition it took from an encyclopedia, confusing the record that was before this Court in *Benson*.

A method claim is "abstract," and therefore not patentable, when it is "separated from embodiment" or "apart from" a particular implementation

The test we propose, grounded in technology and simple to determine as well as reconciling all this Court's decisions, is that a method claim is abstract, and therefore not patentable, when it is "separated from embodiment" or "apart from" a particular implementation such as on a digital computer. Under this test, the fact that Benson's claims *could* be performed by a digital computer does not make them statutory subject matter. When a claim encompasses both statutory and non-statutory subject matter, the claim should be non-statutory, lest a person be able to get a patent that covers abstract methods.

This dictionary definition comports with this Court's latest opinion on statutory subject matter, *Bilski*, which endorsed the "machine-or-transformation test" as "an important and useful clue" but not the "sole" test, as the Federal Circuit had held. Under that test, a process is statutory if "it is tied to a particular machine or apparatus." This includes the machine formed when a digital computer is programmed as an embodiment of the claimed method. As the Federal Circuit noted:

> such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed

> to perform particular functions pursuant to instructions from program software.[11]

This continues to be an excellent description of the role of software in the control of a computer-implemented machine because programming a computer literally produces circuitry that is equivalent to clearly-patentable hardwired circuitry.[12]

Claiming computer-implemented inventions as methods helps produce good patents

There is a strong appeal for claiming a computer-implemented invention as a process or method.[13] Method steps are often the clearest way to describe the scope of this type of invention, making the claim easier for a patent examiner or court to determine the applicable prior art and for someone to determine infringement. Claimed method steps also make it easier for those who try to advance technology by developing alternative method steps for accomplishing the same result as that of the claimed method steps.

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[11] *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994).

[12] James R. Goodman, Todd E. Marlette, and Peter K. Trzyna, "Toward a Fact-based Standard for Determining Whether Programmed Computers are Patentable Subject Matter: The Scientific Wisdom of *Alappat* and the Ignorance of *Trovato I*," *Journal of the Patent and Trademark Office Society*, May 1995, Vol. 77, No. 5, 353-367; James R. Goodman, Todd E. Marlette, and Peter K. Trzyna, "The *Alappat* Standard for Determining That Programmed Computers are Patentable Subject Matter," *Journal of the Patent and Trademark Office Society*, October 1994, Vol. 76, No. 10, 727-802.

[13] The terms "process" and "method" are interchangeable. See 35 U.S.C. § 100(b).

A recent book[14] posits that a major problem with patents is that it is difficult to determine what is covered by a patent, and this lack of a predictable property right produces uncertainty for developers and costly disputes that detract from the positive incentives of the patent system. The authors' research found that only in some sectors of technology, such as the pharmaceutical industry, do patents act as advertised, with their benefits outweighing their costs, while for software, the lack of clear claiming has had a definite negative effect.

Computer technology has matured considerably in the four decades since this Court decided *Benson*, with that opinion's concern about preempting all ways of doing something now highly unlikely, unless what is being claimed is such an advance over the prior art that it deserves patent protection. More likely, broad claims will be unpatentable based on prior art, and it is not necessary (or desirable) to use a statutory subject matter rejection to prevent issuance of such a patent.[15]

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[14] James Bessen and Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovation at Risk*, Princeton University Press, 2008.

[15] For example, even around the time of *Benson* this Court unanimously held a claimed computer-based invention unpatentable not because it wasn't statutory subject matter, but because it was obvious in light of the prior art. *Dann v. Johnson*, 425 U.S. 219 (1976). With hundreds of thousands of patents and publications in the computer art, such rejections of overly-broad patents are even easier.

When tied to a computer, a method claim is definitely *not* a transformation of an abstract idea, law of nature, or physical phenomena into a patented process by merely having a draftsman attach some form of post-solution activity to a mathematical formula, as this Court warned about in *Flook*.[16] Instead, claiming a process may be the best way to meet the statutory requirement of a claim "particularly pointing out and distinctly claiming"[17] the computer-implemented invention.

Patents on computer-implemented inventions are not nonstatutory patents on mathematics

One argument the opponents of patents for computer-implemented inventions make is that software is mathematics, and mathematics is not patentable, presumably because it is a "law of nature,"[18] or, if not tied to a computer as discussed above, "abstract."

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[16] But it is likely that whatever test courts adopt for computer-implemented inventions, patent prosecutors will find a way to write claims that meet it, since many have an engineering background trained to creatively work around constraints. For example, consider United States Patent 3,568,156, "Text Matching Algorithm," granted March 2, 1971, and assigned to Bell Telephone Laboratories. It discloses both an implementation as a computer program and an unlikely, but clearly statutory, implementation as circuitry, and then writes the claim in "means for" language which covers whatever is described in the specification.

[17] 35 U.S.C. § 112(b).

[18] *Benson*, 409 U.S. 63 (1972) is generally cited for that proposition.

But in most instances, the correspondence between computer programs and mathematics is merely cosmetic. For example, Einstein's famous equation $E=mc^2$ expresses a relationship between energy and matter, while the computer program statement E=M*C**2 represents the calculation of M times C raised to the second power and then assigning the result to a storage location named E. The program statement E=M*C**3 is equally valid in a computer program, but would be simply wrong as a natural law.

Unfortunately for understanding this distinction, early developers of programming languages made their calculation-and-assignment statements look like mathematical equations to seem familiar to scientists and engineers. However, a computer program is a series of statements that, when executed by processor circuitry, control machine operations and assign the result to a designated memory location, not a set of mathematical equations that are solved for their variables.

Even if we were to assume that a computer program includes a series of mathematical equations, that assumption ignores how computer-implemented inventions are usually claimed. Claims that include data structures in random-access memories, input devices such as keyboards or mice, screen display devices, clocks and time-outs, and computer networks (common in computer-implemented patents) cannot be considered equivalent to pure mathematics.

And if the post solution activity is indeed trivial, then infringement can be easily avoided by avoiding the triviality.

Two important caveats regarding the use of the dictionary definition as the "abstract idea" test

It is important to keep two things in mind regarding this definition of an "abstract," and therefore nonstatutory, idea.

First, this definition does not impose any new requirement for an embodiment in a machine for any process or method claim that is otherwise statutory under existing law. Process claims that transform or reduce an article to a different state or thing, recognized since *Cochran v. Deener*,[19] remain statutory subject matter because the are clearly not "abstract ideas."

Second, just because a method claim is explicitly limited to a computer embodiment, and is not an "abstract idea" but statutory subject matter does not mean that the claim is patentable. The claim must also meet the statutory requirements that the claim be limited to what is novel, non-obvious, and commensurate with what is disclosed in the patent application.

A problem with patents on computer-implemented inventions is *not* that they are claimed as a method, but that they may claim more than what was disclosed in their patent application.[20]

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[19] 94 U.S. 780 (1877).

Thus, while an old method implemented on a computer is statutory subject matter under the definition test of "abstract" discussed above, the claim cannot now be patented because today it is well-known how to program a computer to implement the old method. Even if computer programming was somewhat of a mystery at the time of *Benson*, today junior high school students (or even younger) are now writing computer programs. Giving the examiner a simple, definitional rule for the initial determination of statutory subject matter will give more time for the important determination of whether a claimed invention is obvious or not, particularly in light of well-known methods.

Using a method claim, rather than a machine claim, coupled with the Federal Circuit's developing law on full-scope of enablement,[21] discourages the use of overly-broad claim language, lest their patent claims be invalid for lack of enablement. Claiming as a method makes it easier to determine whether the claim is commensurate with the disclosure. And unlike claiming the invention using functional elements, claiming as method steps should avoid having to guess at what structure in the specification defines each claim element, how broadly that structure should be read, and what are its equivalents.

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[20] This goes to the heart of the "patent bargain" – an inventor getting a patent in trade for disclosing how to make and use the claimed invention. In *O'Reilly v. Morse*, 15 How. 62 (1854), claim 8, the use of "electro-magnetism, however, developed for marking or printing intelligible characters, signs, or letters, at any distance" went well beyond what was disclosed in the application, and was properly rejected.

[21] See, for example, *Sitrick v. Dreamworks*, 85 U.S.P.Q.2d 1826 (Fed. Cir. 2008).

Computer-implemented apparatus claims are clearly patentable as "machines"

Nowhere is the confusion created by not understanding this Court's simple "abstract ideas" test more clear than in this case. Claims to a "data processing system" comprising a number of tangible devices were treated as if they were method claims, and then found nonstatutory as "abstract ideas."[22]

The answer to whether a computer-implemented invention is statutory subject matter when claimed as a computer[23] or data processing system should be clear. Of course, it is a machine. Babbage's analytical engine, perhaps the first programmable computer, was designed using gears and similar mechanisms, reading its instructions off a set of cards particular to a given problem. Nobody would question whether it was a "machine," even though what it did could be changed by supplying a new program.

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[22] By attempting to use technologically unsound characterizations of the claims, rather than the actual requirements of the claims, the Federal Circuit issued six separate decisions with none commanding a majority, spanning more than 125 pages in the 5-5 split, which as Judge Newman stated in her separate opinion, the Court in *CLS Bank* "propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation. Today's irresolution concerning Section 101 affects not only this court and the trial courts, but also PTO examiners and agency tribunals, and all who invent and invest in new technology." Newman Op. at 1-2

[23] While the term "computer" once meant a person who carried out calculation by hand, few today know that old meaning and instead think of it as short for an electronic digital computer.

The computer program running on the embedded processor on an appliance such as a washing machine turns that embedded processor into a special-purpose washing machine controller, replacing the mechanical controller of past washing machines. Because the power and flexibility of the embedded controller allows the washing machine to perform functions that would be impractical using a conventional controller with motors and gears, the embedded controller would be patentable if novel and non-obvious. Babbage's analytical engine, impractical to implement given the mechanical technology of his day, has become today's computer, practical because the gears have been replaced by electronic circuits.

It is always possible to implement the technique of a computer as special-purpose hardware, although for any but the most simple techniques, it is impractical. This is why as more functionality is desired, programmed embedded general-purpose processors are replacing specialized electronic circuitry, just as such circuitry replaced mechanical devices.

Unfortunately, not looking at the particular claims that define the invention, and instead considering only a caricature of that invention, precludes a technologically-sound determination of whether a particular claim recites statutory subject matter. Rather than simply observe that a claim is to, for example, a machine and then proceed to determining whether that machine is new and non-obvious, for computer-implemented inventions the machine is often viewed as a method and then after separating the method from the machine, determining whether it is "abstract," a term not used in computer science in that context. It is not surprising that we are here after over four decades of opinions on when and how computer-implemented inventions are patentable.

This Court last term, in the *Myriad* case,[24] was able to come to a unanimous opinion by looking at what was actually being claimed and recognizing that some claims were unpatentable because they covered naturally-occurring human DNA but some claims were patentable because they covered man-made cDNA, rather than simply considering all the claims as to "human DNA." Similarly, observing that some of the claims in this case are for methods, which may or may not be nonstatutorily "abstract," and some are clearly for statutory "machines," considerably simplifies the analysis and yields a clear and technically-sound result.

Again, note that a computer-implemented invention claimed as a machine does *not* mean that the claim is patentable. Rather, it only means that the claim has passed the statutory subject matter hurdle, and the requirements of novelty, nonobviousness, and sufficient disclosure must still be considered. Having a simple test, well-grounded in technology, such as "a computer is a machine and therefore statutory subject matter" will shift the time spent trying to determine whether the claim is statutory to better examination of the application to assure that patent claims are not granted on something that is obvious or outside of what is taught in the patent application.

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[24] *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. ___ (2013).

Conclusion

The law of statutory subject matter regarding computer-implemented inventions will remain muddled as long as lower courts are unsure of what this Court meant by an "abstract idea." This is a problem, because experience shows that time spent on trying to determine whether a claim recites statutory subject matter takes away from the more-important determination of whether the claimed invention represents the novelty and unobviousness and the adequacy of disclosure that is the heart of the patent bargain.

But this problem is can be easily solved by this Court's opinion in this case.

First this Court can make it clear that one must not lump all computer-implemented inventions into the method category unless that is the specific form of the claim. Computers are clearly man-made objects, and machine claims for them recite statutory subject matter. But that does not mean that a computer-implemented invention is patentable just because it is claimed as a machine. The implementation of an old technique on a computer using standard techniques is clearly obvious, even if the technique has never been computerized before. Other statutory requirements for patentability must also be considered.

Second, this Court can clarify that an "abstract idea" is one that has no claimed embodiment, perhaps even being done by hand, which as discussed above is in accord with the *Benson-Flook-Diehr* trilogy recently confirmed in *Bilski*. But again, simply tying it to a machine does not make it patentable. As with machine claims, method claims must be new, non-obvious, and adequately disclosed, the other key tests for granting or invalidating a patent.

This Court should use this case to restore proper emphasis on when something is be patentable – when an adequately-disclosed invention is a non-obvious advance over the prior art – by adopting the clear and simple test for when a claim to a computer-implemented invention is to statutory subject matter, as we propose: a test that draws distinctions supported by the underlying technology.

To do that, we strongly urge this Court to grant the writ of certiorari in this case.

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AMICUS
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BRIEF

RECORD
AND
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IN THE
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ALICE CORP. PTY. LTD,
Petitioner,

v.

CLS INTERNATIONAL AND CLS SERVICES LTD.,
Respondent.

On Petition for a Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit

BRIEF OF *AMICUS CURIAE* IEEE-USA IN SUPPORT OF GRANT OF *CERTIORARI*

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STATEMENT OF INTEREST OF *AMICUS CURIAE* [1]

IEEE-USA is an organizational unit of The Institute of Electrical and Electronics Engineers, Inc. (IEEE), the world's largest organization for technical professionals, and a leading educational and scientific association for the advancement of technology. IEEE-USA supports the nation's prosperity and competiveness by fostering technological innovation for the benefit of all, including more than 200,000 U.S. engineers, scientists, and allied professionals who are members of the IEEE.

As part of its mission, IEEE-USA seeks to ensure that U.S. intellectual property law serves to promote the progress of science and the useful arts consistent with the principles set forth by our Nation's Founders. IEEE-USA's members serve on the "front line" of the United States patent system. Our membership includes inventors who create and use cutting-edge technology, who research and publish professional articles and journals, and who develop published standards that form the bases of widely adopted and critical technologies. IEEE-USA members are more than merely scientists and research engineers; they are also entrepreneurs and employees of firms that acquire, license, and market patented technology.

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[1] Pursuant to Supreme Court Rule 37.6, counsel listed on the cover states that this brief was authored by *amicus curiae* and reviewed by counsel, and that counsel for a party did not author this brief in whole or in part. Nor did counsel for a party make a monetary contribution intended to fund the preparation or submission of the brief. In addition, all parties have consented to the filing of this *amicus* brief, and their consent letters are on file with the Clerk's office.

IEEE-USA recognizes that the promotion of scientific and technological progress requires a delicate balance of the interests of producers and users of intellectual property, and IEEE-USA consistently speaks for that balance. IEEE-USA has the broad experience and balanced perspective to aid the Court as it interprets the law to achieve the constitutional directive of promoting progress in science and the useful arts. IEEE-USA has offered its experience at the intersection of technology and law as *amicus* in a number of cases, and this Court adopted the rule of decision offered by IEEE-USA in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.,* 535 U.S. 722 (2002).

This case presents an extraordinarily important question regarding inventors' rights and patent law, an area of law important to IEEE's U.S. members and the innovation ecosystem for scientists, engineers, and entrepreneurs. IEEE-USA recognizes the important role of § 101 in protecting the public interest and right to innovate. However, IEEE-USA also recognizes the crucial role patents play in encouraging innovation, in giving startup companies (and new business lines within existing companies) the breathing room and protection needed to compete in market niches dominated by market incumbents, and in attracting investment capital to risky technological ventures.

SUMMARY OF ARGUMENT

This Court's precedent for the application of 35 U.S.C. § 101, defining the *kind* of inventions that can be patented, diverges along two irreconcilable lines.

This Court's decision in *Diamond v. Diehr*, 450 U.S. 175 (1981) taught that in a § 101 inquiry, each element of an invention is measured against a § 101 standard, that is, whether there is at least one element that is neither *"abstract"* (purely in the human mind) nor *"natural"* (as opposed to manmade). *Diehr* explained that the analysis for the *kind* of invention eligible under § 101 is "wholly apart" from the analysis for whether the invention or any element is *new* and differentiated from the prior art.

In contrast, the approach of *Mayo Collaborative Svcs. v. Prometheus Laboratories, Inc.*, 566 U.S. ___, 132 S.Ct. 1289 (2012) evaluates an invention for an "inventive concept" using the analysis and language traditionally reserved for "*novelty*" and "*obviousness*"—that is, the components of the invention are weighed against the standards of § 102 and § 103, without considering whether the components are laws of nature, abstract, or otherwise relevant to traditional concerns arising under § 101.

The two approaches are irreconcilably in conflict with each other. When applied to fact patterns, the two approaches reach opposite results.

This Court's reasoning in *Mayo* is inconsistent with this Court's reasoning in *Diehr*. The irreconcilable conflict between the *Mayo* and *Diehr* approaches has created confusion in the lower courts. This Court should grant *certiorari* to determine which approach should control in determining patent-eligible subject matter.

ARGUMENT

I. This Court's § 101 Precedent Diverges on Two Irreconcilable Lines—the Court Should Grant *Certiorari* to Determine Which Approach Should Control in Determining Patent-Eligible Subject Matter.

The statute at issue is 35 U.S.C. § 101, defining the *kind* of inventions that can be patented:

> **35 USC § 101 Inventions patentable**
>
> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

§ 101 distinguishes patentable inventions (generally in technology and the "useful arts") from unpatentable subject matter such as the fine arts, abstract principles that are not applied to any practical use, and the like.

A. The Two Incompatible Approaches: *Diehr* and *Mayo*

This Court's decision in *Diehr* taught that in a § 101 inquiry, each element of a patent claim is measured against a § 101 standard, that is, whether there is at least one claim element that is *not "abstract"* (purely in the human mind), or *not "natural"* (as opposed to manmade). *Diehr*, 450 U.S. at 185. *Diehr* explained that the requirements and analysis for the *kind* of invention eligible under § 101 is "wholly apart" from the requirements and analysis for whether the invention or any element is *new* and differentiated from the prior art. *Diehr*, 450 U.S. at 190. *Diehr* notes that whether the invention or any element is differentiated from the prior art is only relevant under § 102 and § 103.

The second approach, which is inconsistent with *Diehr*, is exemplified by *Mayo*. Under the *Mayo* approach, a § 101 analysis begins by looking for a "law of nature." If a single "law of nature" exists, then the remaining claim elements are reviewed for whether they involve an "inventive concept" as opposed to "well-understood, routine, conventional activity previously engaged in by researchers in the field" (*Mayo*, 132 S.Ct. at 1294)—that is, the claim components are weighed against the standards of § 102 and § 103.

To be sure, neither *Mayo* itself nor the Federal Circuit's plurality opinion expressly relies on § 102 or § 103; both declare that the "inventive concept" analysis under § 101 "does *not* involve the familiar issues of novelty and obviousness that routinely arise under §§ 102 and 103." *CLS Bank Intern. v. Alice Corp. Pty. Ltd.* 717 F.3d 1269, 1282 (Lourie, J., concurring, emphasis added). Yet, the analysis used in *Mayo* and by the panel majority is precisely that commonly used to analyze obviousness under § 103, relying on established § 103 terminology, evidence, and analytical techniques. IEEE-USA is unaware of any authority other than § 103 for determining an "inventive concept;" and this Court has often observed in all other contexts that "there is no legally recognizable ... 'essential' element, 'gist' or 'heart' of the invention," *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 345 (1961). By the same token, strikingly absent from *Mayo* is any weight given to the "manmade" or nonabstract nature of elements, the factors that are relevant under the *Diehr* § 101 approach. Since the only established body of law relying on concerns anything like those invoked in *Mayo* and the Federal Circuit's plurality opinion are § 102 and § 103, this brief refers to it as such.

In *Diehr*, the invention centered on the Arrhenius equation, a relationship between temperature and chemical reaction rate that had been known for eighty years. Use of the equation in computer control of rubber molding was known for at least five years. The *Diehr* court measured the remaining claim language—particularly the phrase "opening the press"—against the "abstract" and "law of nature" yardstick of § 101, rather than weighing it in the balance of § 102 and § 103. *Diehr*, 450 U.S. at 187. The *Diehr* Court concluded that "opening the press," though old and routine, is not *abstract*. *See id.* at 188-89. Rather, "opening the press" is language that *applies* a law of nature or abstract idea to a practical, man-made process. *Id.* at 187. That non-abstract application was the relevant fact in determining patent eligibility. *Id.* at 187-89.

The *Diehr* Court gave a simple explanation, 450 U.S. at 188-189 (emphasis added, citations, quotations, and footnotes omitted) for application of its approach for using a § 101 yardstick instead of a § 102/§ 103 balance when evaluating subject matter eligibility:

> In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. ...
>
> It has been urged that novelty is an appropriate consideration under § 101. Presumably, this argument results from the language in § 101 referring to any "new and useful" process, machine, etc. Section 101, however, is a general statement of the type of subject matter that is eligible for patent protection "subject to the conditions and requirements of this title." Specific conditions for patentability follow and § 102 covers in detail the conditions relating to novelty. The question therefore of whether a particular invention is novel is "wholly apart from whether the invention falls into a category of statutory subject matter."

The *Diehr* Court further warned of the consequences of applying novelty and nonobviousness concepts in the context of § 101 (*Diehr*, 450 U.S. at 189 n. 12):

> It is argued that the procedure of dissecting a claim into old and new elements is mandated by our decision in *Flook* ... petitioner premises his argument that if everything other than the algorithm is determined to be old in the art, then the claim cannot recite statutory subject matter. ... To accept the analysis proffered by the petitioner would, if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious. ...

In contrast, *Mayo* uses exactly the "dissect and discount the conventional" approach that is disapproved in *Diehr*. The *Mayo* approach determines whether an invention is the *kind* of invention eligible under § 101 by weighing claim limitations for novelty (under § 102) and non-obviousness (under § 103). The *Mayo* Court dissected the patent claim into constituent parts, and then proceeded to discount each part sequentially from consideration by using the language of novelty and nonobviousness (*Mayo*, 132 S.Ct. at 1297-98):

- "pre-existing"
- used "long before"
- "well known in the art"

- "well-understood, routine, conventional activity previously engaged in"
- "conventional or obvious"

Mayo attempts to reconcile itself with *Diehr* by noting a silence in *Diehr* (*Mayo*, 132 S.Ct. at 1298-99):

> The [*Diehr*] Court pointed out that the basic mathematical equation, like a law of nature, was not patentable. But it found the overall process patent eligible because of the way the additional steps of the process integrated the [Arrhenius] equation into the process as a whole. Those steps included "installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time." [*Diehr*, 450 U.S. at 187.] It nowhere suggested that all these steps, or at least the combination of those steps, were in context obvious, already in use, or purely conventional.

But *Diehr* is *not* silent on this issue. *Diehr* expressly stated that the facts relied on in *Mayo are not to be considered* (*Diehr*, 450 U.S. at 188-189):

> The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101

categories of possibly patentable subject matter.

This Court's reasoning in *Mayo* is inconsistent with the Court's reasoning in *Diehr*. *Diehr* keeps the statutory sections separate. *Mayo* mixes them together. The analysis in *Mayo*—picking the claim apart, and weighing whether each component of the claimed invention was either known or would have been part of the ordinary course of the art, without measuring it against the § 101 abstractness—is perfectly at home as an obviousness inquiry under § 103, but that is not the § 101 yardstick taught in *Diehr*.

The split among the judges of the Federal Circuit in this case tracks the split among this Court's precedent. In this case at the Federal Circuit, the original panel majority, and the *en banc* dissents of judges Newman, Linn, and Moore, followed the *Diehr* approach, with the dissent of Chief Judge Rader trying to find a middle ground. The *en banc* plurality opinion of Judge Lourie followed the *Mayo* approach.

The facts of *Diehr* and *Mayo* can be used to illustrate prime examples of how the two approaches are incompatible, and reach opposite results.

B. The *Mayo* Approach Applied to the *Diehr* Facts Leads to the Opposite Outcome

When Diehr filed his original patent application in 1973, the prior art knew the following steps in molding rubber articles:[2]

- inputting into a computer various numerical properties of the rubber batch and the mold,
- computing a cure time for the molding process using the Arrhenius equation,
- heating the mold press for the calculated time, and
- opening the press at the end of the computed cure time.

The Arrhenius equation is a law of nature, known for eighty years before Diehr's invention, and used in computer control of rubber molding for at least five years before. *See* U.S. Pat. No. 3,649,729. The sole difference between the prior art and Diehr's method was an algorithm (*Diehr*, 450 U.S. at 179):

- continuously, at frequent intervals, measuring the temperature of the curing rubber, and *recomputing* the total cure time.

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[2] *See, e.g.*, Method of curing a rubber or plastic tire, U.S. Pat. No. 3,649,729 (filed 1967), which was made of record during examination of Diehr's patent.

This illustrates the direct conflict between the *Mayo* approach and the *Diehr* approach. A "mathematical algorithm" standing alone is an "abstract idea." *Parker v. Flook*, 437 U.S. 584, 594 (1978). Under the *Mayo* approach, if the only new element of a claimed process is a mathematical algorithm or formula, that process is unpatentable. *Flook*, 437 U.S. at 594. But an algorithm, and repetition of routine measurement and mathematical calculation, is the only difference between Diehr's invention and the prior art.

Had this Court used the *Mayo* analysis on the *Diehr* facts, the Court would have dissected Diehr's claim into its constituent parts, would have noted that repeated temperature measurement and time calculation was an abstract "mathematical algorithm," and that repeatedly executing a set of computer instructions for carrying out a task that used to be performed once was well known to those in the art. A *Mayo* analysis would have finished off by discounting each remaining step as old, well-known, directed to persons in the relevant art, or the like.

Instead, the *Diehr* Court noted that Diehr's claim—*as a whole*—applied well-known scientific and abstract algorithm concepts—to *a new context*, an improved and practical process for curing rubber. *Diehr*, 450 U.S. at 184. In essence, any single limitation that could not be performed in the human mind or by nature unaided by human intervention—*e.g.*, measuring a temperature of a physical process, or opening an industrial mold press—converted Diehr's recognition of applicability of an "abstract" principle such as an algorithm into a patentable application of that principle. The *Diehr* Court expressly held that the old-or-new status of individual components of Diehr's invention was *irrelevant* to a § 101 analysis. *Id.* at 193 n. 15. However, because Diehr's claim recited language that could not be performed by nature unaided, and could not be performed in the "abstract" by the human mind, the claim *as a whole* satisfied § 101. *Diehr*, 450 U.S. at 191.

C. The *Diehr* Approach Applied to the *Mayo* Facts Leads to the Opposite Outcome

Conversely, as the Government's brief[3] in *Mayo* explained, the *Diehr* approach to the *Mayo* facts leads to the conclusion that the *Mayo* claim was directed to eligible subject matter, contrary to this Court's holding. In *Mayo*, the patent was directed to optimizing dosing of a synthetic chemotherapy drug for a particular patient. The inventor realized that a metabolite of the drug produced by the body served as a good marker for whether the dose was too high, too low, or just right. The claim at issue in *Mayo*, in paraphrase, recited:

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[3] *Mayo v. Prometheus*, Brief for the United States as Amicus Curiae Supporting Neither Party, 2011 WL 4040414 (Sep. 9, 2011).

- administering a non-naturally-occurring chemotherapy drug that metabolizes into 6-thioguanine,
- measuring the blood level of 6-thioguanine, and
- based on the blood levels of 6-thioguanine, deciding whether to increase or decrease the amount of drug to be administered in the future.

Under the *Diehr* approach, the claim in *Mayo* would be *taken as a whole*, without "dissect[ing] the claims into old and new elements and then . . . ignor[ing] the presence of the old elements in the analysis." *Diehr*, 450 U.S. at 188. Rather, under the *Diehr* approach, claim elements are reviewed for their § 101 properties—whether they are purely natural, or purely mental and "abstract." In *Mayo*, the human body's processing of the drug into 6-thioguanine is a purely natural phenomenon, analogous to computation of the Arrhenius equation in *Diehr*. Two claim recitations of *Mayo* are neither natural nor abstract (the two issues relevant under § 101), and are therefore analogous to "opening the press" of *Diehr*:

- "administering a drug providing 6–thioguanine"—a drug that is manmade, that *never* existed in nature, and
- "determining the level of 6–thioguanine" in the patient—blood levels have to be measured using man-made apparatus, and cannot be done either by nature or the human mind without manmade technology.

Each of these would be independently sufficient under *Diehr* to remove the *Mayo* invention from the realm of "law of nature" and "abstract idea." That either is "conventional" or "well known" is *irrelevant* under § 101. Under the *Diehr* approach, the *Mayo* invention is more than a raw "law of nature" or an abstract principle, and is thus the *kind* of invention that is eligible under § 101.[4] (IEEE-USA agrees with the Government's brief in *Mayo*, that the analytical steps relied on by the *Mayo* Court are appropriate under § 103—they are highly relevant, just not *under § 101* when using the *Diehr* approach.)

D. Other Examples Show that *Mayo* and *Diehr* Are Irreconcilably in Conflict

For another example, consider the "low tire pressure" indicator in most modern cars. The only difference between a car with a low tire pressure indicator and a car with antilock brakes is "mathematical" software. The sensors used in detecting low tire pressure were conventional and preexisting, because they are the sensors used in automotive antilock brake systems. However, a clever engineer noted that a tire with low pressure rotates at a different rate than tires with normal pressure. Therefore, the same data from the same automotive antilock brake system's sensors could be used to detect when one wheel is turning slightly faster than the other three. By simply using software to mathematically compute and compare four wheel rotation rates (and turning on an indicator light on the dashboard when the rates differed by a specified amount), the engineer came forth with a new invention. The invention of low tire pressure sensing may or may not be obvious, but certainly no one would contest that it is in *kind* patent-eligible subject matter.

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[4] As the Government's brief in *Mayo* noted, the claims are likely invalid under [§ 102 and § 103]," using *the very same facts that the Court relied on under § 101*, although "the claims describe patent-*eligible* subject matter" (2011 WL at *9, emphasis in original). The overall patentability of a claimed invention, including, subject matter eligibility, novelty, and non-obviousness would have all been conducted, just in a different order, with facts slotted into different pigeonholes.

Under the *Diehr* approach, "low tire pressure" indicators in modern cars would indeed be found to constitute in *kind* patent-eligible subject matter, because the mathematics at the heart is driven by non-abstract sensors. On the other hand, under the *Mayo* approach, the low-pressure indicator would likely *not* constitute in *kind* patent-eligible subject matter:

- The software used to mathematically compute and compare four wheel rotation rates and provide an alert when the rates differ by a specified amount embody an abstract "mathematical algorithm" or "algorithmic" concept.

The various rationales enumerated in *Mayo* for discounting claim elements from the invention then remove each remaining element of the tire pressure indicator:

- the sensors were conventional and preexisting;
- the data from the tire rotation were already being collected; and
- the devices and systems for data, computation, and the indicator lighting were either preexisting or conventional.

Other examples where the *Mayo* and *Diehr* approaches would provide different results in patent-eligible subject matter include:

- Improvement to a car's electronic fuel injection often takes the form of a mathematical algorithm that computes spark timing based on engine speed, temperature, gasoline properties, automobile weight, road incline, and the like. Engine timing was previously controlled by cams, levers, vacuum, and the like, with clever bends or tooth face shapes. Software now fills many of the niches formerly filled by mechanical systems. Under the *Diehr* approach, improved electronic fuel injection systems are in *kind* patent-eligible subject matter, even though implemented by purely mathematical software. On the other hand, under a *Mayo* approach, today's software-based process control systems are *not* patent-eligible subject matter in *kind*.
- In medical diagnostic imaging, the raw image collected by the detectors is often unintelligible. Rather, mathematical software separates one tissue type from another, tumor from healthy tissue, active brain region from quiescent. This image processing is based almost entirely on mathematical algorithms (Fourier transforms,

Butterworth filters, contour detection, and the like). Under *Diehr*, the step of collecting data from a non-abstract but conventional sensor separates an abstract algorithm from an eligible invention that applies the algorithm. Under *Mayo*, the fact that the difference is "pure mathematics" removes the invention from patentability.

- Modern data storage, video streaming, and cell phones would be impossible without image compression and other digital signal processing, to reduce the amount of data by 90 percent or more, or to extract intelligible signal out of noise. Again, these inventions are often purely mathematical algorithms that make the difference between feasible and infeasible communications. Successive improvements arise by tuning the algorithm. Under the *Diehr* approach, image compression and other digital signal processing systems are in *kind* patent-eligible subject matter. On the other hand, under a *Mayo* approach, if the improvement can be characterized as mathematical, it's irrelevant that the improvement is set in the context of a purely manmade, practical, nonabstract device.
- Computerized trading systems for securities have transformed markets by making them faster and less expensive. Some involve "abstract" mathematical or organizational principles, choosing what data to display and how, applied to arrange computer displays to communicate more information or reduce error, or to allow humans to understand trends and apply findings to real-life scenarios These inventions require large

investment in design, coding, testing, marketing, regulatory review and approval. Under a *Diehr* approach, the fact that the invention is executed on a computer, or displayed on a physical display device, suffices to make it the *kind* of invention eligible under § 101 (leaving novelty and nonobviousness to § 102 and § 103). Under a *Mayo* approach, inventions related to data analysis and modeling might be characterized as an "abstract idea" with insignificant "post solution" displaying.

As the above examples illustrate, the two irreconcilably contradictory approaches to determining patent-eligible subject matter can lead to confusion. IEEE-USA is concerned that the confusion results in an overly narrow scope for patent-eligible subject matter, despite nonobvious inventive effort and immense investment in turning an invention into a practical product. IEEE-USA urges that this Court should grant *certiorari* to resolve the irreconcilable contradictions between the *Diehr* approach and the *Mayo* approach.

E. This Court Regrounded its Approach Before, in 1980-81

This case will not be the first time that this Court has regrounded its § 101 jurisprudence in the text of the statute. In the late 1970's, after *Gottschalk v. Benson*, 409 U.S. 63 (1972) and *Flook* in 1978, both following the approach later adopted in *Mayo*, the § 101 field was in great disarray. In 1979, in the case that reached this Court in *Diamond v. Chakrabarty*, 447 U.S. 303 (1980), the appeals court decision that was affirmed by this Court was written by Judge Giles Rich. In 1952, Mr. Rich had been the lead author of the 1952 Patent Act, and he later served as the Chief Judge of the Court of Customs and Patent Appeals. Judge Rich, in *In re Bergy and Chakrabarty*, 596 F.2d 952 (CCPA 1979), gave a detailed explanation of the statutory scheme, and the relationship among the three statutory provisions. Judge Rich gave a detailed history of the statute over 140 years, of the treatises, the Reviser's Note and other legislative history of the 1952 Act, 596 F.2d at 960-62. In part, Judge Rich wrote as follows (italic in original, underline added, citations and quotations omitted):

> Section 101 states three requirements: novelty, utility, and statutory subject matter. The understanding that these three requirements are *separate and distinct* is long-standing and has been universally accepted. The text writers are all in accord and treat these requirements under separate chapters and headings. [listing treatises]. Thus, the questions of whether a particular invention is *novel* or *useful* are questions wholly apart from whether the invention falls into a category of statutory subject matter. Of the three requirements Stated in § 101, only two, utility and *statutory subject matter*, are *applied* under § 101. As we shall show, in 1952 Congress voiced its intent to consider the novelty of an invention under § 102 ... notwithstanding the fact that this requirement is first Named in § 101.

Bergy contrasts the "the statutory-categories requirement of § 101 with a requirement for the existence of 'invention' [renamed nonobviousness by the 1952 Act]" (596 F.2d at 962-63, italic in original):

> Falling into a category, does not involve considerations of novelty or nonobviousness and *only* those two considerations involve comparison with prior art or inquiry as to whether all or any part of the invention is or is not in, or assumed to be in, the prior art or the public domain. *Prior art is irrelevant to the determination of statutory subject matter under § 101.* An invention can be statutory subject matter and be 100% old, devoid of any utility, or entirely obvious.....

In 1980 and 1981, this Court reconsidered its approach to the § 101 issue. In *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) and *Diamond v. Diehr*, 450 U.S. 175 (1981), this Court essentially repudiated the reasoning of *Benson* and *Flook*, and borrowed much from Judge Rich's *Bergy*. The Court shifted from an analysis that mixed together questions of novelty and subject matter (similar to the *Mayo* approach), to the *Diehr* model that focused on whether any abstract principle was practically *applied* in some real-world way. The *Diehr* approach was entirely workable and reasonably stable and predictable for 30 years, until *Mayo* reinjected concerns of novelty into the § 101 inquiry.

IEEE-USA reads this Court's precedents to set out two distinct and contradictory approaches to determining patent eligible subject matter: the

Diehr approach which evaluates § 101 eligibility based on the claim "as a whole," "wholly apart" from novelty and non-obviousness of components; vs. the *Mayo* approach which evaluates eligible subject matter by disassembling a patent claim into constituent parts, and characterizing each part in terms of its novelty and non-obviousness.

This Court should grant *certiorari* to resolve the irreconcilable contradictions between the *Diehr* approach and the *Mayo* approach.

II. This Court Should Grant *certiorari* to Establish the Correct Rule of Law

The Federal Circuit opinions in this case are fractured along the lines separating the *Mayo* and the *Diehr* approaches. It is evident that this split cannot be reconciled without this Court's review.

The confusion created by this fracture at the Federal Circuit will have many negative impacts on technology businesses, including unpredictability at the U.S. Patent Office regarding which patents it will reject based on § 101, in the courts, regarding patents that issued years ago, and in licensing.

As Judge Moore noted in her dissent, this case presents a broad spectrum of fact patterns, so that this Court can carefully vet out a number of implications and alternatives. This case presents a good vehicle for this Court "to distinguish between claims that *are* and *are not* directed to patentable subject matter." *CLS*, 717 F.3d at 1314 (Moore, J. dissenting-in-part, emphasis in original).

Given the irreconcilable conflict between the *Mayo* and the *Diehr* approaches, and the confusion that the conflict has created in the lower courts' evaluation of subject matter eligibility, this Court should grant *certiorari* to determine which approach is correct for evaluating § 101 issues.

CONCLUSION

For the foregoing reasons, the IEEE-USA therefore respectfully urges this Court to grant *certiorari*.

Respectfully submitted,

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AMICUS
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BRIEF

RECORD
AND
BRIEFS

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF THE INTELLECTUAL PROPERTY LAW ASSOCIATION OF CHICAGO AS AMICUS CURIAE IN SUPPORT OF GRANTING THE PETITION

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INTEREST OF AMICUS CURIAE

The Intellectual Property Law Association of Chicago ("IPLAC") submits this brief as amicus curiae in support of the petition for a writ of certiorari, but in support of neither party on the ultimate merits of the case.[1]

Founded in 1884, the Intellectual Property Law Association of Chicago is a voluntary bar association of over 1,000 members who practice in the areas of patents, trademarks, copyrights, trade secrets and the legal issues they present. IPLAC is the country's oldest bar association devoted exclusively to intellectual property matters. In litigation, IPLAC's members are split about equally between plaintiffs and defendants. Its members include attorneys in private and corporate practices before federal bars throughout the United States, as well as the U.S. Patent and Trademark Office and the U.S. Copyright Office. As part of its central objectives, IPLAC is dedicated to aiding in the development of intellectual property law, especially in the federal courts.[2]

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[1] Pursuant to Supreme Court Rule 37.2(a), the parties were given at least 10 days' notice of IPLAC's intention to file a brief as amicus curiae. Petitioner and respondents each have filed and lodged with the Clerk a letter of consent to the filing of amicus curiae briefs in support of either party or of neither party. Pursuant to Supreme Court Rule 37.6, this brief was not authored, in whole or in part, by counsel to a party, and no monetary contribution to the preparation or submission of this brief was made by any person or entity other than IPLAC or its counsel. After reasonable investigation, IPLAC believes that no member of its Board or Litigation or Amicus Committee who voted to prepare this brief on its behalf, or any attorney in the law firm or corporation of such a board or committee member, represents a party with respect to this litigation. Some committee members or attorneys in their respective law firms or corporations may represent entities that have an interest in other matters which may be affected by the outcome of this litigation.

SUMMARY OF ARGUMENT

The Federal Circuit, sitting en banc, did not provide guidance on how the federal courts and the U.S. Patent and Trademark Office ("PTO") should apply 35 U.S.C. § 101 to computer-implemented inventions. *See CLS Bank Int'l v. Alice Corp.*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc). Instead, the Federal Circuit's en banc decision introduced conflicting tests on patent eligible subject matter under § 101, exacerbating the confusion and uncertainty that already exist in this area of patent law. This Court should grant the petition for writ of certiorari because the Federal Circuit has been unable, and shows no indication that it will be able in the future, to provide guidance on a threshold question in patent law, i.e., what test or guidelines should be applied for determining whether computer-implemented inventions are patent eligible subject matter under 35 U.S.C. § 101?

Moreover, grant of the petition for writ of certiorari is urgently needed to provide guidance to the PTO in its daily examination of computer-implemented inventions. Following the Federal

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[2] While over 30 federal judges are honorary members of IPLAC, none of them was consulted or participated in any way regarding this brief.

Circuit's fractured en banc opinion, the PTO has been left in a conundrum of continuing the examination of computer-implemented inventions under an approach that the PTO itself has acknowledged is "no longer sufficient." To allow the PTO to continue its patent examination under an insufficient approach in a key technology sector for the U.S. economy is untenable and must be remedied by this Court.[3]

ARGUMENT

I. GRANT OF THE PETITION FOR WRIT OF CERTIORARI IS NEEDED TO RESOLVE THE FEDERAL CIRCUIT'S CONFLICTING TESTS FOR PATENTABLE SUBJECT MATTER UNDER § 101

In its divided opinions on rehearing en banc, the Federal Circuit introduced conflicting tests for patent eligible subject matter under 35 U.S.C. § 101, which causes ambiguity and confusion in the law and necessitates the grant of the petition for a writ of certiorari. While a seven-judge majority affirmed, *per curiam*, that the method and computer-readable media claims of the patent at issue did not constitute patent eligible subject matter under § 101, there was no majority opinion to guide the lower courts in reviewing such patent claims in the future. Instead, the Federal Circuit issued multiple separate, often conflicting opinions, plus "Additional Reflections" from Judge Rader, on determination of patent eligibility of computer-implemented inventions. Moreover, the en banc panel was evenly divided on the patent eligibility of the asserted system claims and thus affirmed the district court's holding that the system claims are not directed to patent eligible subject matter under § 101.

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[3] In the specific class of the U.S. Patent Classification System, in which Petitioner's patents were classified by the PTO, Class 705, there were approximately 4,854 issued patents in 2012 alone. This represents only a small fraction of the numerous classes for patent applications relating to computer-implemented inventions. *See* http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cbcby.pdf.

For example, Judge Lourie's concurring opinion (joined by Judges Dyk, Prost, Reyna and Wallach) took a broad view of patent ineligibility under § 101 for the claims at issue, finding all asserted method, computer readable media and system claims ineligible for patent protection. Judge Lourie emphasized the preemption test, i.e., whether a claim covers an abstract idea that preempts all uses of the idea within the stated field. *See CLS Bank Int'l v. Alice Corp.*, 717 F.3d 1269, 1273-92 (Fed. Cir. 2013) (en banc). He added that "[a]bstract methods do not become patent-eligible machines by being clothed in computer language." *Id.* at 1292.

By contrast, Chief Judge Rader (joined by Judges Linn, Moore and O'Malley) took a narrower view of preemption (and thus a broader view of patent eligible subject matter), finding the asserted system claims patent eligible:

> [I]t is important to remember that all patents 'pre-empt' some future innovation in the sense that they

> preclude others from commercializing the invention without the patentee's permission. Pre-emption is only a subject matter eligibility problem when a claim preempts all practical uses of an abstract idea.

Id. at 1300.

Judge Newman seemed to take the broadest view of patent eligibility under § 101 and found all asserted method, computer readable media and system claims patent eligible subject matter. Directly contradicting Judge Lourie's plurality opinion, Judge Newman rejected the focus on preemption, writing that "[t]here is no need for an all-purpose definition of 'abstractness' or 'preemption,' as heroically attempted today." *Id.* at 1322.

As set forth above, the Federal Circuit not only was unable to reach common ground, but also the divided panel propounded conflicting standards for determining patent eligibility of computer-implemented inventions under § 101. The Federal Circuit's conflicting opinions add confusion and uncertainty in the law for the federal courts and the PTO. This Court's guidance is needed to resolve such conflicting standards for patent eligibility for computer-implemented inventions, which is not only an extremely important and evolving area of patent law but also a key industry sector of the U.S. economy.

II. GRANT OF THE PETITION FOR WRIT OF CERTIORARI IS URGENTLY NEEDED TO GUIDE THE PTO IN ITS DAILY EXAMINATION PRACTICE

As a practical matter, this Court cannot ignore the conundrum that the PTO now faces in the wake of the "multiple divergent opinions" rendered by the Federal Circuit's en banc panel. *See* App. A, 3a, May 13, 2013 Memorandum from PTO Deputy Commissioner for Patent Examination Policy to Patent Examining Corps, available at http://www.uspto.gov/patents/law/exam/clsbank_20130513.pdf. The divided opinions of the Federal Circuit have left the PTO in the untenable position of continuing its daily examination of computer-implemented inventions under an approach it has acknowledged as "no longer sufficient." *See CLS Bank Int'l v. Alice Corp.*, Appeal No. 2011-1301, Br. for the United States as Amicus Curiae on Rehearing En Banc In Support of Neither Party (Fed. Cir. December 14, 2012) at 5-6.

Specifically, in its brief in support of rehearing en banc, the PTO explained that it needed the Federal Circuit's guidance because "[i]n light of *Bilski* and *Mayo*, ***the government recognizes that its longstanding approach to the eligibility of computer-implemented inventions is no longer sufficient***." *Id.* (emphasis added).

However, the Federal Circuit's multiple divided opinions do not provide the guidance and clarity the PTO urgently needs. As a result, the PTO provided the following notice to its Patent Examining Corps:

> On May 10, 2013, the Federal Circuit issued the highly anticipated decision in *CLS Bank* involving subject matter eligibility of computer-implemented inventions under 35 U.S.C. § 101. The purpose of this memorandum is to notify the Patent Examining Corps that, at present, ***there is no change in examination procedure for evaluating subject matter eligibility***. Current procedure detailed in MPEP 2106 should continue to be followed.

App. A, 1a, May 13, 2013 Memorandum from PTO Deputy Commissioner for Patent Examination Policy to Patent Examining Corps, available at http://www.uspto.gov/patents/law/exam/clsbank_20130513.pdf (emphasis added).

Without further guidance from this Court, the PTO will continue its "no longer sufficient" approach to examining computer-implemented inventions, to the detriment of the PTO, U.S. patent applicants, and computer-based industries. As Judge Newman wrote in her opinion, "[t]oday's ***irresolution*** concerning section 101 affects not only this court and the trial courts, but also the PTO examiners and agency tribunals, and all who invent and invest in new technology." *CLS Bank Int'l v. Alice Corp.*, 717 F.3d 1269, 1321 (Fed. Cir. 2013) (en banc) (emphasis added).

The PTO urgently needs this Court's guidance so that its examiners can properly apply § 101 in its daily practice of patent examination of computer-implemented inventions.

CONCLUSION

For the foregoing reasons, amicus curiae, the Intellectual Property Law Association of Chicago, urges this Court to provide guidance to the lower courts and the PTO and grant the petition for a writ of certiorari.

Respectfully submitted,

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October 7, 2013

* Counsel of Record

APPENDIX

APPENDIX A — MEMORANDUM OF THE UNITED STATES PATENT AND TRADEMARK OFFICE, DATED MAY 13, 2013

United States Patent and Trademark Office

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MEMORANDUM

DATE: May 13, 2013

TO: Patent Examining Corps

FROM: Andrew H. Hirshfeld
Deputy Commissioner
For Patent Examination Policy

SUBJECT: Federal Circuit Decision in *CLS Bank et al. v. Alice Corp.*

On May 10, 2013, the Federal Circuit issued the highly anticipated decision in *CLS Bank* involving subject matter eligibility of computer-implemented inventions under 35 U.S.C. § 101. The purpose of this memorandum is to notify the Patent Examining Corps that, at present, there is **no change** in examination procedure for evaluating subject matter eligibility. Current procedure detailed in MPEP 2106 should continue to be followed.

Appendix A

CLS Bank Decision

The patents in suit relate to a computerized trading platform used for conducting financial transactions in which a third party settles obligations between a first and a second party so as to eliminate "counterparty" or "settlement" risk. The district court found all of the claims invalid because they were directed to an ineligible abstract idea under 35 U.S.C. § 101. The Federal Circuit heard the case *en banc* and affirmed the district court in a divided decision.

Along with the decision, the Federal Circuit also issued six separate opinions by various members of the court concurring, dissenting, and offering reflections on the decision. Despite the Court's sharp divide voiced in the six separate opinions, several important themes emerged, such as:

- There was agreement that the test for eligibility is not a rigid, bright line test and must be made by evaluating a claim as a whole, on a case-by-case basis, using a flexible approach.

- Many of the judges explicitly noted that the test for eligibility is a separate and distinct inquiry from other patentability concerns, particularly novelty and obviousness.

- It was general agreed that when evaluating the claim as a whole the claim must be analyzed to determine whether the additional limitations add

> significantly more, or in other words add meaningful limits, to the abstract idea or law of nature.

Given the multiple divergent opinions, the USPTO is continuing to study the decision in *CLS Bank* and will consider whether further detailed guidance is needed on patent subject matter eligibility under 35 U.S.C. § 101.

AMICUS
CURIAE
BRIEF

RECORD
AND
BRIEFS

Supreme Court, U.S.
FILED
OCT - 7 2013
OFFICE OF THE CLERK

No. 13-298

In the
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,
Respondents.

ON PETITION FOR WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICI CURIAE* STUDENTS OF PATENT LAW MOLLY A. JONES, MIKE H. LIU, KATHERINE D. STEPANOVA, AND JACOB J. TRUE IN SUPPORT OF PETITIONER

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INTEREST OF THE AMICI CURIAE[1]

Amici curiae respectfully submit this brief pursuant to Supreme Court Rule 37 in support of Petitioners. *Amici* are upper-division J.D. and M.S.L. candidates attending the University of California, Hastings College of the Law ("UC Hastings"), currently enrolled in a patent-focused seminar exploring recent developments in patent law.[2] *Amici* have also worked in the patent field both in-house at well-known Silicon Valley technology companies and at a law firm specializing in patent litigation. Finally, as law students studying patent law, *amici* have a strong interest in the proper understanding and interpretation of patentability of software following the Federal Circuit decision in *CLS Bank International v. Alice Corporation Pty. Ltd.*, 717 F.3d 1269 (Fed. Cir. 2013) (*en banc*).

Amici have no interest in any party to this litigation, nor do they have a stake in the outcome of this case other than their interest in correct, consistent interpretation of the patent laws. *Amici* law students have written this brief on their own and are grateful to their Professors, Chris Mammen and Rory Little, for supporting their *amicus* effort.

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[1] *Amici* provided counsel of record with notice of its intent to file this brief ten days prior to the due date, as required by Supreme Court Rule 37.2(a). The parties have submitted letters to the Clerk granting blanket consent to the filing of amicus briefs. No counsel for any party authored this brief in whole or in part, and no person or entity other than *amici* made a monetary contribution intended to fund the preparation or submission of this brief.

[2] University of California, Hastings College of the Law is a top-tier ABA-accredited law school located in San Francisco, California. No part of this brief purports to present UC Hastings's views, if any.

SUMMARY OF THE ARGUMENT

We urge the Court to grant *certiorari* to clarify issues of deep importance to patent owners, particularly in the software industry. Specifically, are claims to computer-implemented inventions directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101, and if so, what standard should the Courts use to determine when an otherwise abstract idea crosses the threshold to patentable subject matter?

This Court has repeatedly granted *certiorari* in cases involving abstract subject matter, but it has declined to explicitly address what standard should be used in cases where the patented invention is computer-implemented. This left the door open for the Federal Circuit to issue its terse opinion in *CLS Bank International v. Alice Corporation Pty. Ltd.*, 717 F.3d 1269 (Fed. Cir. 2013) (*en banc*), which provided no clear standard to be applied in subsequent cases and further added to the instability of the patent system. Meanwhile, the federal courts are deeply divided on this important patent issue.

The petition should be granted for at least three reasons. First, the Federal Circuit's precedents are irreconcilably divided on the issue of patentability of software. The Federal Circuit has articulated a number of tests that are inconsistent with each other, and that contravene this Court's prior rulings. The Court should take up this opportunity to clarify this area of law and reconcile precedent by articulating a "data manipulation test." Under this standard, a claim would not be directed to an abstract idea if the computer's role in the invention is (1) to manipulate data as opposed to merely facilitating the process, and (2) the data manipulation (a) has to do with a particular application within the invention and (b) is necessarily carried out on a computer rather than acting as a proxy for data existing in the world around us.

Second, a clear legal test is needed to prevent gamesmanship in both patent prosecution and patent litigation. Without strong guidance from this Court, patent practitioners will be emboldened to draft around the Federal Circuit's conflicting precedents, to seek patents on claimed inventions that may otherwise be unpatentable, with the result of unnecessarily crowding federal courts' dockets with what would be, if not for the Federal Circuit's confusing and divided opinions, frivolous lawsuits. Finally, it is an economic imperative that such standards are clarified. The intellectual property community requires a predictable legal standard to minimize costly disputes and encourage legitimate competition in the technology industry. Thus, this Court's uniform guidance is needed at this time to settle the conflicting and inefficient lines of precedent coming from the lower courts.

ARGUMENT

I. THE FEDERAL CIRCUIT'S 5-5 *EN BANC* DECISION IN *CLS BANK* LEAVES A VOID FOR A CLEAR STANDARD DUE TO THE VARYING INTERPRETATIONS OF 35 U.S.C. § 101.

The Federal Circuit's conflicting rulings regarding what constitutes "patentable subject-matter" under 35 U.S.C. § 101 in the context of computer-implemented systems or software, has left a lack of clear guidance and an air of uncertainty in the patent and technology communities. Multiple fractured opinions proposing approaches that no majority could agree on have caused, and will continue to cause, confusion among patent practitioners and in the lower courts (not to mention in law school classes). Similarly, these opinions will be an impediment on the proper direction of the United States Patent and Trademark Office ("USPTO"). The lack of clarity in this area of patent law has frustrated the Federal Circuit and led it to explicitly seek guidance from this Court. *See CLS Bank*, 717 F.3d at 1276 (*en banc*) (Lourie, J.) ("§ 101 appears deceptively simple on its face, yet its proper application . . . has long vexed this and other courts"); *id.* at 1314 (Moore, J., dissenting in part) ("Our court is irreconcilably fractured over these system claims . . . . This case presents the opportunity for the Supreme Court to distinguish between claims that *are* and *are not* patent subject matter."); *id.* at 1321 (Newman, J., concurring in part and dissenting in part) (noting the three incompatible standards "serv[e] simply to add to the unreliability and cost of the system of patents"); *id.* at 1335 (Rader, C.J.) ("The intervening commotion leaves us with little, if any, agreement amongst us").

This Court traditionally grants *certiorari* in two circumstances: (1) when addressing with an important federal question, and (2) when there is a split amongst the circuits. *See Rogers v. Mo. Pac R. Co.*, 352 U.S. 521, 530 (1957). The Federal Circuit is a unique institution, in that it is "the only institution of its kind where the development and enforcement of one critical body of international commercial law is committed to a small group of judicial officers." Randall R. Rader, *The United States Court of Appeals for the Federal Circuit: The Promise and Perils of a Court of Limited Jurisdiction*, 5 Marq. Intell. Prop. L. Rev. 1, 3 (2001). Due to its special status, the Federal Circuit must keep pace with not only the rapid speed of technology advancements, but also the high speed of legal developments in the important areas it is charged with overseeing. *Id.* at 7-9. This combination that the court must manage at an accelerated pace also increases the probability of "intra-circuit conflicts" arising. *Id.* at 9. And, because no other circuit has the judicial authority to decide such cases, "intra-circuit conflicts" within the Federal Circuit on patent law issues are the equivalents of circuit splits between two or more of the other Circuit Courts of Appeals in other areas of federal law. *Id.* Here, in the *CLS Bank* petition, this Court is faced with a crucial intra-circuit split in the Federal Circuit and faces the vital task of sorting out the competing visions of computer-assisted patentable subject matter under section 101.

Even when the Federal Circuit has come to a consensus in this area, it has had difficulty consistently applying any single test to evaluate computer-implemented inventions. For example, the Circuit has written that "breadth and lack of specificity does not render the claimed subject matter impermissibly abstract." *Ultramercial LLC v. Hulu*, LLC, 657 F.3d 1323, 1330 (Fed. Cir. 2011) (holding "as a practical application of the general concept of advertising as currency and an improvement to prior art technology, the claimed invention is not 'so manifestly abstract as to override the statutory language of section 101'"). However, in another decision, the Federal Circuit panel opined that "the incidental use of a computer to perform the mental process of claim 3 does not impose a sufficiently meaningful limit on the claim's scope." *Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011) (questioning whether computer-focused limitation "impose[d] a sufficiently meaningful limit on the claim's scope," and whether the computer "play[ed] a significant part in permitting the claim method to be performed."). The Federal Circuit's ongoing failure to provide a unified and consistent standard highlights the inefficient uncertainty in this vital area of the patent law.

A. This Court Should Reinforce its Position That Section 101 Provides a Threshold Test Required to be Implemented During the Pleading or Summary Judgment Stage.

This Court has previously spoken of patentable subject matter as a "threshold test," *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010), as well as a "screening" mechanism. *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1303 (2012). By applying such a label, this Court meant for the section 101 "patentable subject matter" inquiry to be posed prior to other statutory inquiries. *See Parker v. Flook*, 437 U.S. 584, 593 (1978) (stressing "[t]he obligation to determine what type of discovery is sought to be patented must precede the determination of whether that discovery is . . . new or obvious.").

Section 101's screening process for patentable subject matter can only be effective if courts are instructed to distinguish patentable subject matter from unpatentable subject matter at the outset of litigation. To include section 101 as merely one of many patentability-determining factors, and to group it with novelty (35 U.S.C. § 102) and obviousness (35 U.S.C § 103) among other factors and then apply those factors in no particular order, is inconsistent with the purpose of the patentable subject matter inquiry. Some Federal Circuit Judges have even recommended that courts stay clear of section 101's "murky morass" altogether and skip straight to one of the other sections encompassing patentability, even though this Court expressly directed courts to apply section 101 as a "threshold test" in *Bilski*. *See MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1260 (Fed. Cir. 2012). Others have interpreted this Court's ruling in *Prometheus* to have established that sections 101, 102, 103 and 112 each "serve[] a different role" towards the same purpose of assessing patentability, and that because a district court is "master of its own docket," it can choose which provision to apply first in determining whether a patent is valid. *CLS Bank Int'l v. Alice*

Corp. Pty. Ltd., 685 F.3d 1341, 1348, *reh'g en banc granted, opinion vacated*, 484 F. App'x 559 (Fed. Cir 2012) (citing *Prometheus*, 132 S. Ct. at 1303-04).

This Court has stated its position on section 101: it is a threshold test for patent-eligibility and has priority in being applied before other sections dealing with patentability. But the Federal Circuit, following *Bilski*, has continued to express its doubt about the absoluteness and necessity of section 101 as a threshold test. *Smartgene, Inc. v. Advanced Biological Lab., SA*, 852 F. Supp. 2d 42, 51 (Fed. Cir. 2012). The Federal Circuit's continuing questioning of section 101's threshold status, and that court's aversion to motions to dismiss based on patentable subject matter, goes against this Court's articulated role for the doctrine as a screening mechanism to eliminate bad patents in the early stages of litigation. For this reason, this Court should grant *certiorari* to clarify that the proper role of patentable subject matter is as a threshold inquiry.

B. This Court Should Clearly Define What it Means For a Computer to Play an "Integral" Role in a System, Method or Process.

The Federal Circuit first attempted to explain how the implementation of a computer could make an otherwise patent-ineligible process patent-eligible, in the last case it decided before that Circuit granted the *en banc* petition in this case. *Bancorp Services, L.L.C. v. Sun Life Assurance Co. of Canada*, 687 F.3d 1266 (Fed. Cir. 2012). The court in *Bancorp* stated that "[t]o salvage an otherwise patent-ineligible process, a computer must be integral to the claimed invention, facilitating the process in a way that a person making calculations or computations could not." This approach seems to focus more on the computer's role in the process and is less concerned with the claim's scope, although the *Bancorp* court appeared to apply computer integration as a meaningful limit on the claim's scope. Although the court applied computer "integration" as a test to clear the confusion when confronting an invention that utilizes computer processes on an abstract idea, its failure to define clearly "integral" makes the test impossible to apply consistently. It is unclear what the Federal Circuit meant when it specified that in order for a computer to be integral it must "facilitate[e] the process in a way that a person making calculations or computations could not." *Id.* at 1278. This language works toward the exclusion of inventions that employ a general-purpose computer, but the vague requirement fails to identify exactly what a computer serving more than a general purpose is.

In *Bilski*, this Court had an opportunity to prevent the ambiguity of computer system-tied processes, but instead chose to only narrowly address the patentable subject matter issue, holding that the machine or transformation test was a "useful and important clue" but "*not* the *sole* test for deciding whether an invention is a patent-eligible 'process.'" 130 S. Ct. at 3221 (emphasis added); *c.f. In re Bilski*, 545 F.3d 943, 954 (Fed. Cir. 2008) ("[a] claimed patent process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing").

This Court decided in *Bilski* that it was not necessary to provide any further guidance, stating that it "need not define further what constitutes a patentable 'process,' beyond pointing to the definition of that term provided in § 100(b) and looking to the guideposts in *Benson*, *Flook* and *Diehr*." *Id.* at 3231. Subsequent to this Court's narrow ruling disapproving the machine or transformation test as the sole test for process claims, the Federal Circuit and many district courts have struggled to come up with a consistent and unifying standard for analyzing the patent-eligibility of a computer-tied process.

This Court should thus grant *certiorari* to also state a clear standard and correct the conflicting Federal Circuit guidance concerning the subject matter eligibility of computer-implemented inventions. Rather than defining what is not patentable subject matter in the negative, this Court should affirmatively articulate what is patentable subject matter, so that practitioners and the Federal Circuit can distinguish when the use of a computer as a limitation in a method claim plays "a significant part" in the invention as opposed to acting merely as "an obvious mechanism for permitting a solution to be achieved more quickly." *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1333 (Fed. Cir. 2010).

It is in the best interest of the patent community that this Court establish a clear standard, derived from its existing jurisprudence, that any computer implementation of a method conceivably performable without a computer is nevertheless patent-eligible if the computer provides some functional benefit in addition to mere efficiency and convenience.

This Court has held that a specified process that incorporates an abstract idea (such as a mathematical equation) with additional steps, which "do not pre-empt the [broader] use of [the] equation" can be patentable. *Diamond v. Diehr*, 450 U.S. 175, 187 (1981) (holding patent for a process that integrated a mathematical equation in molding raw rubber into a cured, molded rubber product constituted patentable subject matter). By contrast, in *Prometheus*, this Court made clear that a process simply directing a natural law or abstract idea to be applied is not patent-eligible because it would preempt use of the idea and preclude further discoveries even if the law of nature is narrow in scope, 132 S. Ct. at 1301, or the formula is limited "to a particular technology environment." *Bilski*, 130 S. Ct. at 3230. In the present case, this Court should articulate a limiting standard that not only addresses the narrowness of the scope, but also the computer's integral involvement in the process limiting the abstract idea to a specific purpose.

The courts and the patent community would be best served by a standard that sets forth the type of computer involvement in a system method or process patent that will limit an abstract idea sufficiently to transform it into a patentable process. Such a standard should posit that the computer must do more than merely be present as a connector, and must actually manipulate the data that is inherent to the computer. The manipulated data must be narrowly focused on the internal functionality of the computer and not represent information taken from the external world (i.e.

credit card numbers, bank accounts, etc.). Finally, the data manipulated must be directed to specific applications.[3]

Applying this standard to a patentability case, *Research Corp. Technologies v. Microsoft*, that was found to have a patent-eligible system process, the process focused on pixels (as data), which were directly manipulated by the computer system. Those pixels were a step removed from the real-world image the pixels created, making it inherent to the computer; and the claim had no scope beyond the computer because the computer was necessary for the implementation of the pixels. 627 F.3d 859, 868 (Fed. Cir. 2010) (process involved a comparison of pixels and a blue noise mask; while the pixels make up an image, which is potentially a direct representation of the world, the process operates one level lower, on the pixels themselves). A standard similar to the one described above would resolve confusion in the Federal Circuit, while continuing to allow for the inclusive patent system that the Constitution, Congress, and this Court have sought to maintain.

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[3] *See* Robert D. Swanson, *Note: Section 101 and Computer-Implemented Inventions*, 16 Stan. Tech. L. Rev. 161, 177 (2012) (noting the "data manipulation test" is simple to administer, difficult to draft around, and is drawn from current precedent).

II. CERTAINTY IS NEEDED TO DISCOURAGE LITIGATION AND PATENT PROSECUTION BASED SOLELY ON TECHNICALITIES, WHICH UNNECESSARILY ADDS TO AN ALREADY CROWDED PATENT DOCKET.

The Federal Circuit issued its 5-5 *en banc* decision with accompanying concurrences and dissents in *CLS Bank Int'l v. Alice Corp.*, spanning over 135 pages, while providing as the precedential portion only a one-page *per curiam* opinion (which affirmed the district court's ruling that the asserted method, computer-readable medium, and system claims were not eligible subject matter under section 101). Notably, the Federal Circuit was unable to decide what the test for determining whether a computer-implemented invention is a patent-ineligible "abstract idea" really is – and whether the presence of a computer in a claim leads to patent-eligibility for an otherwise patent-ineligible "abstract idea." Further adding to the confusion, the Circuit's various non-precedential opinions proposed three different tests for evaluating patent-eligibility under section 101. The one paragraph *per curiam* opinion in this case leaves more questions than answers. As Chief Judge Rader explained, "nothing said today beyond our judgment has the weight of precedent." *CLS Bank*, 717 F.3d at 1292 n.1. Judge Newman opined, "we have propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation." *Id.* at 1321 (Newman, J., concurring in part and dissenting in part). Judge Moore claimed that the opinion could have a negative impact on a whole field of patents: "if all of these claims, including the system claims, are not patent-eligible, this case is the death of hundreds of thousands of patents, including all business method, financial system, and software patents as well as many computer implemented and telecommunications patents." *Id.* at 1313 (Moore, J., dissenting in part).

While software patents continue to be challenged on subject matter patent-eligibility grounds, patentees are still without a solid answer as to how far section 101 reaches to disqualify software or business-method patents as "abstract ideas." Without a precedential opinion, district courts may conclude that they must employ all three tests when assessing patent-eligibility under section 101. This Court should grant *certiorari* to eliminate this confusion and provide clear and much-needed guidance on these issues. As even Judge Moore pointed out, this Court could take this case as an opportunity to "distinguish between claims that *are* and *are not* directed to patentable subject matter." *Id.* at 1314. The lead opinion (by Judge Lourie and joined by Judges Dyk, Prost, Reyna, and Wallach, which would have affirmed the district court's decision striking down several patents related to a computerized trading platform used for conducting financial transactions in which a third party settles obligations between a first and a second party in a way that eliminates risk) sought to develop "a consistent, cohesive, and accessible approach to the § 101 analysis—a framework that will provide guidance and predictability for patent applicants and examiners, litigants, and the courts." *Id.* at 1277. But unfortunately, that is exactly what the collection of separate opinions failed to do: articulate a clear patent-eligibility standard for computer-implemented inventions, something patentees and practitioners were sorely hoping for.

The *en banc* Federal Circuit's divided opinions has created a vacuum rather than a standard. Unsurprisingly, prospective patentees are not incentivized to consider strategies and engage in gamesmanship to keep pending cases before the USPTO and/or court in order to try to draft and present claims best suited for any of the three tests or any future test yet to be articulated. As articulated by Judge Newman, "with [the] judicial deadlock, the only assurance is that any successful innovation is likely to be challenged in opportunistic litigation, whose result will depend on the random selection of the panel." *Id.* at 1321. Patentees in the process of drafting or filing new applications may consider including as many unnecessary details for their claims as possible, adding work for the USPTO and the courts, hoping that the details might mask what might otherwise be flagged as "abstract idea" claims. Furthermore, "[r]eliable application of legal principles underlies the economic incentive purpose of patent law. . . . Today's irresolution concerning section 101 affects not only this Court and the trial courts, but also the USPTO examiners and agency tribunals, and all who invent and invest in new technology." *Id.*

There simply should not be a 5-5 tie with respect to federal law as it applies to software and computer-implemented technologies. Such a tie leaves the USPTO without a clear direction regarding how to process patent applications and to apply the *CLS Bank* decision. Patent practitioners will understandably be at a loss as to how to write patent applications covering important innovations in the area of software and computer implemented technologies. While the impact of the *CLS Bank* case may be unclear for those seeking real guidance and clear standard, those who thrive on the idea that there is no standard may engage in filing frivolous lawsuits and invalid patent application filings, claiming that their "abstract ideas" are tied to computer implementations and have a true "inventive concept" under the subject matter test articulated in the *CLS Bank* lead – but non-precedential – opinion.

Such a trend had already been exhibited in the debate regarding business-method patents. The definition of a business method is sufficiently vague that any attempt to limit its patentability can be evaded with skillful claim drafting. *See* John R. Allison & Starling D. Hunter, *On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods*, 21 BERKELEY TECH. L. J. 729, 736 n.17 (2006) ("Carving out business method patent applications for harsher treatment would ultimately prove largely futile and possibly even counterproductive – futile because skilled patent attorneys can often draft applications so as to opt out of a predefined category"); *see also* Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 9 n.29 (2001) (describing "the doctrine of the magic words," that prevailed during the 1980s and early 1990s, under which "software was patentable subject matter, but only if the applicant recited the magic words and pretended that she was patenting something else").

Lower courts also will now be likely to see an emergence of new claims in which challengers attack the validity of others' patents by saying that the computer-implemented claims are not well-supported in the patents' specifications. The accused infringers then would look to invalidate software or business method patents as patent-ineligible under section 101 when the claims fail to recite computer implementation limitations. For claims that do recite some computer implementation, accused infringers may still succeed by determining and focusing on whether the inventions are truly directed to an abstract idea or concept central to the field of science or technology at issue, which otherwise might be wholly preempted if the patent were enforced. One study establishes that software and business-method patents account for nearly forty percent of the total cost of patent litigation and that such costs are increasing. *See* James Bessen & Michael J. Meurer, ***Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk***, 22 n.1 (2008). What makes business-method patents prone to attract litigation is their abstract quality, which provides little notice for firms and increases the probability of inadvertent infringement. *Id.* at 23 ("Software patents are much more likely than other patents to have their claim construction reviewed on appeal – an implicit indication that parties to lawsuits have fundamental uncertainty over the boundaries of these patents."). As Bessen and Meurer observe, "it is well-known among computer scientists that software technologies (algorithms, system structures) can be represented in many different ways, and . . . this means that the technology claimed in a patent can be difficult to distinguish from alternatives." *Id.* The same holds true for most business methods, which often incorporate software or cover processes dealing with information management (*e.g.*, financial instruments, negotiation tactics, styles of legal argument) that are subjective – an art rather than a science -- and far less precise than a machine or a drug that can be described in concrete terms. *See Id*. at 198.

III. THIS COURT'S GUIDANCE IS NEEDED TO CURB THE OVERALL INCREASES IN LITIGATION COSTS RELATED TO SOFTWARE PATENTS.

Litigation costs money and time to the parties as well as to the courts. The median cost of litigation is reported to be more than $2.6 million, for cases where the amount sought was between one million dollars and twenty-five million dollars. American Intellectual Property Law Association, *AIPLA Report of the Economic Survey* I-131 (2013). In cases where the contested amount was over twenty-five million dollars, the median costs of litigation were twice as much as for claims in the lower range.[4] *Id.* at I-133. Perhaps most importantly, in cases where less than one million dollars was in dispute, the cost of litigation sometimes surpassed the amount actually at stake. *Id.* at I-129. This last statistic poses a challenge to individual inventors and other small entities whose ingenuity and inventive contributions can be valuable to society as a whole. It is somewhat of an assumption that a smaller disputed amount should correspond to smaller-sized inventive parties. But clarity on patentability should help all parties, small or big, to be more selective in entering litigation, thereby saving money, energy, court resources, and technical bandwidth, for development rather than litigation.

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[4] These litigation cost figures cover mostly attorneys' fees, including discovery. The figures account also for expert witness fees, travel, and document management and production. *Id.* at 34.

From 1995 to 2011, software was the seventh-highest subject matter for patent litigation cases, composing 5.8% of patent cases out of 1,751 decisions by district courts. Price WaterhouseCoopers LLP, *2012 Patent Litigation Study* 13, available at http://www.pwc.com/us/en/forensic-services/publications/2012-patent-litigation-study.jhtml (accessed October 2, 2013). The number of cases from the software industry has risen since 1995, jumping from fourteen identified decisions in the period 1995–2000, to twenty-three identified decisions in the period 2001–2005, and growing to a subtotal of sixty-five identified decisions in the period 2006–2011. *Id.* at 14. In terms of amount of litigation relative to that in other industries, software rose in rank from tenth in the 1995–2000 period, to eighth in the 2001–2005 period, to sixth in the 2006–2011 period. *Id.* The number of software patent disputes that end up in court is clearly on an upward trend.

Some portion of patent disputes invariably will continue to go to trial. Even a clear elucidation of both the patent-eligibility threshold and the appraisable meanings for "integral" or "integrated" will not eliminate all patent issue trials – and *amici* do not suggest or expect an extreme shift such as that. A clarifying decision from this Court would also not guarantee the cessation of dubious patent-infringement claims leveled by non-practicing entities (NPEs). But a considered and thorough opinion from this Court will nevertheless establish adept precedent, something that the Federal Circuit, despite toil and earnest scrutiny, has been unable to do. *CLS Bank* poses a suitable and representative case for review, as its scenario includes issues that are common potential quarrels with software-embodied intellectual works. A firm ruling from this Court would, it is hoped, proactively trim the frequency of litigation of software patent disputes – in particular those that fall into a repetitive pattern – and advance the hygiene of the software patents area. The increased volume of software patent litigation and the costs attendant to unclear or conflicting legal standards merit that the Court take up this case for detailed review.

CONCLUSION

To ignore the question of patentability of computer-implemented patents is to acquiesce in continued uncertainty in the patent community and to passively endorse more crowded USPTO and patent court dockets. *Amici* urge this Court to grant Petitioners' writ of *certiorari* to clarify the Questions that the Petitioner presents.

Respectfully submitted,

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October 7, 2013

AMICUS CURIAE BRIEF

No. 13-298

RECORD
AND
BRIEFS

OCT 7 - [illegible]

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

**ON PETITION FOR A WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT**

BRIEF OF NEW YORK INTELLECTUAL PROPERTY LAW ASSOCIATION AS *AMICUS CURIAE* IN SUPPORT OF PETITIONER

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INTEREST OF *AMICUS CURIAE*

The New York Intellectual Property Law Association ("NYIPLA" or "Association") respectfully submits this *amicus curiae* brief in support of Petitioner, Alice Corporation Pty., Ltd ("Alice").[1]

The arguments set forth herein were approved on October 4, 2013 by an absolute majority of the officers and members of the Board of Directors of the NYIPLA, including any officers or directors who did not vote for any reason, including recusal, but do not necessarily reflect the views of a majority of the members of the Association, or of the law or corporate firms with which those members are associated. After reasonable investigation, the NYIPLA believes that no officer or director or member of the Committee on *Amicus* Briefs who voted in favor of filing this brief, nor any attorney associated with any such officer, director or committee member in any law or corporate firm, represents a party in this litigation. Some officers, directors, committee members or associated attorneys may represent entities, including other *amici curiae*, which have an interest in other matters which may be affected by the outcome of this litigation.

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[1] Petitioners consented to the filing of *amicus curiae* briefs in support of either party or neither party in a docket entry dated September 13, 2013, and Respondents consented to this filing in a docket entry dated September 9, 2013. Pursuant to Sup. Ct. R. 37.6, no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than NYIPLA, its members, or its counsel made a monetary contribution to its preparation or submission.

The NYIPLA is a professional association of approximately 1,300 attorneys whose interests and practices lie in the area of patent, trademark, copyright, trade secret and other intellectual property law. The Association's members include a diverse array of attorneys specializing in patent law, from in-house counsel for businesses that own, enforce and challenge patents, to attorneys in private practice who represent inventors in various proceedings before the United States Patent and Trademark Office ("PTO").

A substantial percentage of the Association's member attorneys participate actively in patent litigation, representing both patent owners and accused infringers. The NYIPLA's members also frequently engage in patent licensing matters on their clients' behalf, representing both patent licensors and licensees.

The entities served by the Association's members include inventors, entrepreneurs, venture capitalists, businesses, universities, and industry and trade associations. Many of these entities are involved in research, patenting, financing and other commercial activity relating to the financial industry and other software dependent fields.

The NYIPLA's members and their respective clients have a strong interest in the issues presented by this case because their day-to-day activities depend on the consistently-applied and longstanding broad scope of patent-eligible subject matter under the Patent Act in general. Because of the vital and increasing importance of computer-implemented technology to the economy, moreover, the NYIPLA and its members have a particularly strong interest in ensuring that their reasonable expectation that those principles continue to be consistently applied in those important areas.

INTRODUCTION

> [P]rior to granting *en banc* review in *CLS Bank*, [the Court of Appeals for the Federal Circuit] commented: "no one understands what makes an idea abstract." After *CLS Bank*, nothing has changed. "Our opinions spend page after page revisiting our cases and those of the Supreme Court, and still we continue to disagree vigorously over what is or is not patentable subject matter."

Accenture Global Servs. v. Guidewire Software, Inc., No. 2011-1486, 2013 U.S. App. LEXIS 18446 (Fed. Cir. Sept. 5, 2013) (Rader, C.J., dissenting) (citing *CLS Bank Int'l v. Alice Corp.*, 685 F.3d 1341, 1349 (Fed. Cir. 2012), *opinion vacated*, 484 F. App'x 559 (Fed. Cir. 2012), *petition for cert. filed* (U.S. Sept. 4, 2013) and *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1259 (Fed. Cir. 2012)).

Not surprisingly, the Federal Circuit's lack of clarity *en banc* has led to unpredictable and inconsistent results among the lower courts and placed many patents under a cloud of uncertainty. As aptly stated by the district court in *Zillow, Inc. v. Trulia, Inc.*, after delaying its rulings for the *en banc* decision, the *CLS* decision did not achieve "the hoped for clarity with respect to the test the court should apply here." No. C12-1549JLR, 2013 U.S. Dist. LEXIS 127606, at *5 (W.D. Wash. Sept. 6, 2013).

While NYIPLA offers no opinion on the merit of the claims at issue, NYIPLA respectfully requests that the Court grant Petitioner a Writ of Certiorari to hear the question presented. This case represents an ideal vehicle for the Court to alleviate the current state of confusion that will otherwise linger concerning the law governing patent-eligibility.

In short, this is an important issue, with substantial debate, extensive contradictory authority, no resolution below or likely in the near future without this Court's intervention, and parties and *amici* with substantial economic interests willing to participate.

The Association respectfully submits that this Court's intervention is necessary to clarify the law of patent eligibility and more specifically the scope of the abstract idea exception to patent eligibility, at least as applied to computer-implemented inventions.

ARGUMENT

I. THE CURRENT STATE OF PATENT-ELIGIBLE SUBJECT MATTER UNDER 35 U.S.C. § 101 IS UNCLEAR

In *Bilski v. Kappos*, this Court reaffirmed the general principles that govern patent-eligible subject matter under Section 101, as synthesized in *Diamond v. Diehr.* This Court has consistently framed the inquiry based on two questions:

1. Does the claimed subject matter fall within one of the four statutory categories of patent-eligible

subject matter: (i) process, (ii) machine, (iii) manufacture, or (iv) composition of matter (or any improvement thereof)?

2. If so, is the claimed subject matter directed to one of three so-called "fundamental principles," *i.e.*, laws of nature, natural phenomena or abstract ideas, which are exceptions to patent-eligible subject matter?

See Bilski v. Kappos, 130 S. Ct. 3218, 3225 (2010); *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (harmonizing, *inter alia*, *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980); *Parker v. Flook*, 437 U.S. 584, 589 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)).[2]

The NYIPLA respectfully submits that the first inquiry should be a clear and logical application of the U.S. patent statutes and Supreme Court jurisprudence.

However, as discussed below, the lower courts have reached inconsistent conclusions as to the subject matter within the "abstract idea" exception in the second question. In fact, even after the Federal Circuit squarely raised this issue to be considered *en banc*, some were so unsure about the state of the law that one of the Federal Circuit Judges questioned the validity of "hundreds of thousands of patents." *CLS Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269,

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[2] Last term, the Supreme Court reaffirmed these principles in *Mayo Collaborative Services v. Prometheus Labs.*, 132 S. Ct. 1289 (2012), in the context of addressing the laws of nature exception to patent-eligibility. However, some of the discussion in *Mayo* has led to confusion, as discussed below.

1313 (Fed. Cir. 2013) (Moore, J., dissenting). Innovators, courts, and patent practitioners alike need guidance from this Court to identify those patents properly directed to inventions that do not cover patent-ineligible "fundamental principles."

A. The law on patent-eligibility has become confused

At the time this Court decided *Bilski v. Kappos*, which reaffirmed its previous precedent in *Diehr*, the analysis of whether a claim fell under the exception of an abstract idea was relatively straightforward. The precedent for analyzing claims involving abstract ideas included guidance that the machine-or-transformation test is a useful, but not dispositive, tool, the *application* of an abstract idea may be patent-eligible subject matter, and claims should be considered as a whole for abstractness. *Bilski*, 130 S. Ct. at 3227, 3230 (citing *Diehr*, 450 U.S. at 187-88).

Bilski reflects this Court's recognition of Congress' express intent to permit broad patent-eligibility with limited judicial exceptions. *Bilski*, 130 S. Ct. at 3231 ("the Court once again declines to impose limitations on the Patent Act that are inconsistent with the Act's text."); *see also Diamond v. Chakrabarty*, 447 U.S. 303, 309 (U.S. 1980) ("Congress intended statutory subject matter to 'include anything under the sun that is made by man.'"). Although the Court in *Bilski* declined to exclusively use the machine-or-transformation test, it openly encouraged the Federal Circuit to continue to try and delineate other limiting criteria to patent-eligible subject matter. *Id.* at 3231 ("In disapproving an exclusive machine-or-transformation test, we by no means foreclose the Federal Circuit's development of other limiting criteria that further the purposes of the Patent Act and are not inconsistent with its text.").[3]

Since *Bilski*, however, the Federal Circuit has not yet developed a reliable approach to this Section 101 analysis and judicial analysis of "abstract ideas" has become muddled.[4] Instead, widely divergent tests and approaches to evaluating patent-eligibility under Section 101 arose as evidenced by the six opinions offered by the *en banc* panel below.

For example, inconsistent with this Court's directive in *Diehr* to analyze the claim as a whole, some Federal Circuit panels have appeared to dissect claims into their various elements and analyze the elements considered to be "inventive" divorced from the remaining elements of the claim. *See, e.g., Bancorp Servs., LLC v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1279 (Fed. Cir. 2012) (setting aside purportedly "insignificant computer-based limitations" and then analyzing the additional features that remain in the claims ignoring the computer aspects.); *Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1374 (Fed. Cir. 2011) (explaining that the patent-eligibility analysis must "look to the *underlying invention* for patent-eligibility purposes" rather than limit the analysis to the statutory category ("process, machine, manufacture, or composition of matter") of the claim language) (emphasis added).

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[3] As noted by the majority opinion in *Bilski* at the Federal Circuit, other efforts by the Federal Circuit and its predecessor courts to create rules on patent-eligibility were inadequate. *In re Bilski*, 545 F.3d 943, 959-60 (Fed. Cir. 2008) (Explaining, for example, that the "Freeman-Walter-Abele test is inadequate," "the 'useful, concrete and tangible results' test is inadequate," and that the "technological arts" test is "unclear" and "no such test has ever been explicitly adopted" by any court).

[4] *See generally* Charles R. Macedo & Sandra A. Hudak, *Understanding Patent Eligibility of New Technology in the United States*, J. Intell. Prop. L. & Prac. (2012), *available at* www.arelaw.com/publications/view/patenteligibilityus.

Some have attributed those departures to language in *Mayo* which suggests that a requirement for patent-eligibility is that a claim "ha[ve] additional features that provide practical assurance that the [claim] is more than a drafting effort designed to monopolize the [fundamental principle] itself." *Mayo*, 132 S. Ct. at 1297; *see Bancorp*, 687 F.3d at 1279 (interpreting *Mayo*'s statement—"What else is there in the claims before us?"—as setting aside the fundamental principle in the claim at issue rather than analyzing the elements of the claim as a whole). Yet the Court, in *Mayo* nor otherwise, did not expressly disavow or overrule its instructions in *Diehr*, which would be a required step to reach such an explanation for neglecting to consider the claim as a whole. *Diehr*, 450 U.S. at 188.

The Federal Circuit's variability in its approaches to Section 101 mainly stems from a divergence of views at the Federal Circuit regarding how much of a bar patent-eligibility should be to obtaining a claim:

1. Some judges have required that claims must be "manifestly abstract" in order to be patent ineligible under Section 101. *See e.g.*, *MySpace*, 672 F.3d at 1264; *Classen Immunotherapies v. Biogen IDEC*, 659 F.3d 1057, 1065-66 (Fed. Cir. 2011); *Ultramercial, LLC v. Hulu, LLC*, 657

F.3d 1323, 1327 (Fed. Cir. 2011), *cert. granted, vacated and remanded*, 132 S. Ct. 2431 (2012), *rev'd and remanded*, 722 F.3d 1335 (Fed. Cir. 2013), *petition for cert. pending* (U.S. Aug. 23, 2013) (No. 13-255); *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 868 (Fed. Cir. 2010)).

2. Other judges have used Section 101 as a fine sieve, searching for abstractness by parsing out the claim or insisting on a "robust application" of Section 101 prior to analysis under Sections 102, 103, or 112. *See, e.g., Bancorp*, 687 F.3d at 1279; *MySpace*, 672 F.3d at 1269 (Mayer, J., dissenting) ("[a] robust application of section 101 is required to ensure that the patent laws comport with their constitutionally-defined objective."); *see also Highmark, Inc. v. Allcare Health Mgmt. Sys.*, 687 F.3d 1300, 1324 (Fed. Cir. 2012), *cert. granted*, No. 12-1163, 2013 U.S. LEXIS 5130 (U.S. Oct. 1, 2013) (No. 12-1163) ("Where, as here, a patent describes an abstract idea, but discloses no new technology or "inventive concept," … for applying that idea, a robust application of section 101 at the summary judgment stage will save both courts and litigants years of needless litigation.") (Mayer, J., dissenting).

3. Still others take an approach in between the two: using Section 101 as a "coarse filter" under which abstractness still must be "manifestly evident," but the claims are also broadly evaluated for "meaningful limits" such as meeting the machine-or transformation test or including more than a mere field of use restriction. *See, Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1331, 1333-34 (Fed. Cir. 2012); *Cybersource*, 654 F.3d. at 1375.

The diverse positions underlying these various opinions helps explain why, as the Federal Circuit openly admits, "[d]efining 'abstractness' has presented difficult problems." *Ultramercial*, 722 F.3d at 1342.

B. The fractured *en banc* Federal Circuit opinion further supports granting the petition

The disjointed approaches to patent-eligible subject matter under Section 101 culminated in the *en banc* decision in the present case, with ***six*** different views on the subject and no clear majority to establish precedential guidance. *CLS Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269, 1292 n.1 (Fed. Cir. 2013) (Rader, J., dissenting-in-part) ("[T]hough much is published today discussing the proper approach to the patent eligibility inquiry, nothing said today beyond our judgment has the weight of precedent."). The only issue on which a majority could agree was that the claims at hand are not patent-eligible. *Id.* ("Although a majority of the judges on the court agree that the method claims do not recite patent eligible subject matter, no majority of those judges agrees as to the legal rationale for that conclusion."). However, in the face of the contradictory rationales provided by the court, the fact-specific conclusion as to the patent-eligible status of Alice's patents does little to guide further patent-eligibility analyses.

Unsurprisingly, the lack of a consensus regarding the scope of Section 101 and the patent-eligibility of abstract ideas continues to stymie the lower courts. Recently in *Zillow, Inc. v. Trulia, Inc.*, for which a decision had been deferred pending the decision in *CLS*, the district court again deferred findings regarding patent-eligibility because the Federal Circuit did not provide "the hoped for clarity with respect to the test the court should apply here." No. C12-1549JLR, 2013 U.S. Dist. LEXIS 127606, at *5 (W.D. Wash. Sept. 6, 2013). Without intervention by this Court, it is unlikely that the district court in *Zillow* will receive the guidance it needs to determine patent-eligibility—a lamentable result for the application of a threshold test. *Bilski*, 130 S. Ct. at 3225 ("The § 101 patent eligibility inquiry is only a threshold test.").

The Western District of Washington is not alone in its confusion. Other district courts have been similarly hamstrung by the lack of clarity on how to analyze an invention's patent-eligibility under 35 U.S.C. § 101. Those courts are left to pick on their own from the various proffered approaches, each approach potentially leading to a different outcome. *See, e.g.*, *Planet Bingo, LLC v. VKGS, LLC*, No. 1:12-CV-219, 2013 U.S. Dist. LEXIS 116898, at *11 (W.D. Mich. Aug. 19, 2013) ("[D]espite the seeming futility of adopting one of the non-precedential approaches from *CLS Bank*, the Court will endeavor to follow the law as it sees it."); *Content Extraction & Transmission LLC v. Wells Fargo Bank*, No. 12-2501 (MAS) (TJB), No. 12-6960 (MAS) (TJB), 2013 U.S. Dist. LEXIS 107184, at *12 (D.N.J. July 31, 2013) (describing the analysis for determining abstractness as "ephemeral"). The plethora of divergent and seemingly inconsistent Federal Circuit opinions on this issue has effectively left the district courts without any guidance at all.

Even the PTO concluded that, "[g]iven the multiple divergent opinions", the *en banc* decision warranted further "study" in order to evaluate "whether further detailed guidance is needed on patent subject matter eligibility under 35 U.S.C. § 101." *See, e.g.*, Memorandum from Andrew H. Hirshfeld, Deputy Commissioner for

Patent Examination Policy, to the Patent Examining Corps, Federal Circuit Decision in *CLS Bank et al. v. Alice Corp.*, (May 13, 2013), *available at* http://www.uspto.gov/patents/law/exam/clsbank_20130513.pdf.

Thus, although the Federal Circuit has attempted to provide guiding criteria on a patent-eligibility analysis in more than ten cases since *Bilski*, it has not established a clear directive on how to approach such an analysis and recent history has proven that further percolation through the lower courts will not help resolve existing rifts.

II. CLARIFICATION OF PATENT-ELIGIBILE SUBJECT MATTER IS CRUCIAL

The NYIPLA encourages this Court to grant Petitioner's Writ of Certiorari to hear the question presented because the current confusion on the subject matter eligible for patent protection threatens both the economy-boosting effects of maintaining a functional patent system and faith in the judiciary to produce reliable, consistent outcomes.

A. Patents play a vital role in the economy

Unpredictability in the patent system is harmful to the U.S. economy and the patent system as a whole. As the Economics and Statistics Administration and the PTO reported in March 2012, "[t]he granting and protection of intellectual property rights is vital to promoting innovation and creativity and is an essential element of our free-enterprise, market-based system." Econ. & Statistics Admin. and USPTO, Intellectual Property and the U.S. Economy: Industries in Focus (Mar. 2012), www.

uspto.gov/news/publications/IP_Report_March_2012.pdf. This report recognizes that computers and peripheral equipment are among the most patent-intensive and job-producing sectors in the U.S. economy.[5]

This is why, as Judge Moore explained in her dissent below, leaving the law unclear in this area presents a real danger to our economy. *CLS Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269, 1313 (Fed. Cir. 2013) (Moore, J., dissenting). Specifically, she argued that ignoring this Court's precedent to "evaluate each claim as a whole when analyzing validity" and instead using the reasoning of Judge Lourie's concurring opinion could "render ineligible nearly 20% of all the patents that actually issued in 2011." *Id.* She worries that this decision might "decimate the electronics and software industries" as well as other industries that are built off of computer-implemented patent claims. *Id.* Regardless of whether her ultimate analysis on the validity of the claims at issue in this case is the correct approach, the fact that there is irreconcilable disagreement within the appeals court dedicated to patent law, on the analysis of claims related to such pervasive technology, is destabilizing to the economy.

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[5] Indeed, as Former Director Kappos explained: "Because many breathtaking software-implemented innovations power our modern world, at levels of efficiency and performance unthinkable even just a few years ago, patent protection is every bit as well-deserved for software-implemented innovation as for the innovations that enabled man to fly, and before that for the innovations that enabled man to light the dark with electricity, and before that for the innovations that enabled the industrial revolution." See David Kappos, USPTO Dir., An Examination of Software Patents, Address at Center for Am. Progress (Nov. 20, 2012), available at www.uspto.gov/news/speeches/2012/kappos_CAP.jsp.

The importance of computer-implemented inventions to the U.S. economy extends far beyond the importance of the American computer industry *per se*. Computer-implemented inventions are critical to the productivity of all sectors of the U.S. economy. Computers power our modern service economy as surely as steam and then internal combustion engines powered the manufacturing sector that drove our economic prosperity in the nineteenth and twentieth centuries.

Accordingly, the NYIPLA believes this Court should adopt a clear and consistent jurisprudence that allows for and encourages patent-eligible computer-implemented inventions that promote innovation and creativity.

B. Courts need consistency in precedent in order to preserve judicial resources and provide reliable judgments

Given the current confused state of the law, opinions on Section 101 in the Federal Circuit "spend page after page" arguing over the proper analysis of patent-eligible subject matter. *Accenture*, 2013 U.S. App. LEXIS 18446, at *33 (Rader, C.J., dissenting) (citing *MySpace*, 672 F.3d at 1259). This case alone, which began six years ago, has been fully briefed for all three of its appearances, and resulted in a six-opinion, 135-page split decision. It generated hundreds of pages of Section 101 court analysis and eight different Federal Circuit opinions. Unfortunately, this impressive expenditure of judicial time and resources has led to neither a clear resolution of the proper method of analysis of the patent-eligibility of computer-implemented inventions, nor a uniformity of the patent law on this issue.

This conflicting dialogue has instead created insecurity for all stakeholders involved—innovators, businesses that rely on intellectual property assets, and accused infringers alike. Lack of clarity from the courts has wasted resources and has left district courts without the proper guidance to apply the law to cases before them. *See, e.g.*, *Zillow*, 2013 U.S. Dist. LEXIS 127606, at *22 (re-postponing its decision because of lack of guidance from this case in the hopes that the results of claim construction would assist in the decision) ("[T]he Federal Circuit 'propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation.'" (quoting *CLS Bank*, 717 F.3d at 1321 (Newman, J., concurring in part and dissenting in part)); *Michael Sandborn & Mark Sandborn P'ship v. Avid Tech., Inc.*, No. 11-11472-FDS, 2013 U.S. Dist. LEXIS 126772, at *7 (D. Mass. Sept. 5, 2013) ("Neither the Supreme Court nor the Federal Circuit has set forth any definitive framework for conducting the § 101 analysis in the context of an allegedly abstract concept."); *Planet Bingo*, 2013 U.S. Dist. LEXIS 116898, at *11 ("As a result of the Federal Circuit's present fractured state, this Court is left in a quandary."); *Compression Tech. Solutions v. EMC Corp.*, No. C-12-01746 RMW, 2013 U.S. Dist. LEXIS 78338, at *11 n.1 (N.D. Cal. May 29, 2013) ("The [CLS Bank *en banc*] opinion does not . . . provide a clear test for eligibility under section 101 because a majority of judges could only agree on the holding of the case and not on a legal rationale for their conclusion.").

As discussed above, in addition to stakeholders, the lower courts themselves want Supreme Court guidance. *See, e.g.*, *Planet Bingo*, 2013 U.S. Dist. LEXIS 116898, at

*11 ("As Circuit Judge Newman aptly noted in her *CLS Bank* opinion, as a result of the split en banc decision, "the only assurance" is that, ***unless the Supreme Court takes up the issue again***, the patent-eligibility of any invention challenged on abstractness grounds "*will depend on the random selection of the [Federal Circuit] panel.*" *CLS Bank*, 717 F.3d at 1321." (emphasis added)).

III. THIS IS THE PROPER CASE TO CONSIDER THE ISSUE OF PATENT-ELIGIBLITY

The issues raised during the history of the case below, as well as the dire need for guidance in this area of law, make this case an appropriate choice for revisiting the subject of characterizing abstractness in a patent claim.

A. The Federal Circuit Recognized that this Case Was a Proper Vehicle to Raise the Issue of Patent-Eligibility for *En Banc* Consideration

It is not insignificant that the Federal Circuit hand picked this case to address the patent-eligibility of computer-implemented inventions. *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 484 Fed. Appx. 559, 559 (Fed. Cir. 2012). Unfortunately, since the Federal Circuit did not come up with a cohesive answer to the questions presented, the task has been left with this Court instead.

B. Numerous *Amici* Have Shown an Interest in the Case and Participated at the Federal Circuit

This case has garnered significant input from third parties, including sixteen *amicus curiae* briefs for the *en banc* rehearing at the Federal Circuit. Those briefs, representing the views of patent practitioners, companies in computer and communications related industries, and government agencies, collectively confirm that this case involves an "important question of federal law," and that many believe that the Federal Circuit "decided [this question] in a way that conflicts with relevant decisions of this Court"; thus, this case fits the "character" of the compelling reasons required for Supreme Court review. Sup. Ct. R. 10.

C. The Large Number of Diverse Opinions Presented Below Provide a Rich Dialogue that Raises All Relevant Issues Before the Court

Within the discourse contained in the six split opinions from the *en banc* rehearing, the two opinions from the original appeal to the Federal Circuit, and many hundreds of pages of briefs from the parties and *amici*, there is plenty of material to draw upon in developing an instructive directive on this issue. The patents at issue involve claims directed to methods, computer-readable media, and systems, and thus this Court may provide guidance on how to analyze "abstract ideas" for both processes and tangible objects. The discussion includes exchange over when a Section 101 analysis must take place, how the check for an "inventive concept" is used in a Section 101 analysis, and the extent to which a claim must be evaluated "as a whole." Within this abundance of disagreement, there lies a diamond in the rough—ample material to inform this Court's judgment.

CONCLUSION

The NYIPLA supports the articulation of fair and reasonable principles that can be predictably applied and clearly define the bounds of patent-eligible subject matter. For these reasons, the NYIPLA respectfully urges the Court to grant Alice's Petition.

Respectfully submitted,

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AMICUS
CURIAE
BRIEF

RECORD
AND
BRIEFS

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD,
Petitioner.
v.
CLS BANK INTERNATIONAL, et al.
Respondents.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF AMICUS CURIAE SIGRAM SCHINDLER BETEILIGUNGSGESELLSCHAFT mbH, IN SUPPORT OF PETITIONER

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STATEMENT OF IDENTITY AND INTEREST

Sigram Schindler Beteiligungsgesellschaft mbH and its subsidiaries (collectively "SSBG") are research-based high technology companies located in Berlin, Germany, developing and selling products also in the US, via TELES AG. SSBG is a majority shareholder of TELES AG, founded 1983 by Sigram Schindler1).

SSBG's business is dependent upon patent protection, in particular in the United States and Europe. Strong patent systems require that the patents issued are consistently interpreted. Thus, SSGB has a vested interest in supporting the US patent system in its on-going development in adjusting itself to the needs of emerging technologies. By the groundbreaking *KSR/Bilski/Mayo* decisions this Court undertook big respective steps.

This brief, in support of neither party, is filed on behalf of *Amicus Curiae* SSBG – which has no financial interest in either side.

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[1] Pursuant to Supreme Court Rule 37.6, amicus curiae states, that no counsel for a party authored this brief in whole or in part, and no entity or person other than amicus curiae, its members, and its counsel, made any monetary contribution toward the preparation or submission of this brief. Letters from the parties consenting to the filing of this brief are on file with the Clerk.

SUMMARY OF THE ARGUMENTS

This Amicus Brief in support of *Alice's* Petition is a continuation of SSBG's Amicus Brief in support of *WildTangent's* equivalent Petition [19].

Both Petitions basically ask the Supreme Court for clarification of the question, what requirements § 101 states – as interpreted by the *Mayo* decision, but also the Bilski decision, both by means of claimed "emerging technology inventions" – to be met for a claimed such invention for being patent-eligible. Thereby both Petitioners assume this interpretation is reducible to that of the term "abstract idea" in both decisions' interpretations.

SSBG's *WildTangent* Amicus Brief ("WTAB") just as this one state – guided by the Supreme Court's *KSR/Bilski/Mayo* decisions – the point of view of advanced IT [2]. Namely: This question's answer, if it is supposed to enforce consistency in patent precedents also for claimed such inventions, would not exist at all, if the Supreme Court had not refined – by these decisions – the classical paradigm Substantive Patent Law ("SPL") precedents is based on, established by the Markman/Phillips/Noah decisions, to a refined paradigm, which does enforce the consistency of interpreting all 4 §§ 101/102/103/112.

This refined paradigm of SPL, as required by the *Mayo* decision and retraced by the WTAG [19], leads to two scientific insights into SPL precedents of highest practical significance for any SPL test of claimed such inventions. These insights are, as to a claimed such invention's "whole" and hence compound SPL test:

A) It is totally inseparable as to its 4 also compound as "§-wise" SPL sub-tests, and

B) it is totally separable as to its 10 elementary as "requirement-wise" SPL sub-tests.

Both these scientific insights are of high practical significance:

A) The inseparability of a § 101 test is lingering in SPL precedents since ever. It questions, whether it is at all legally relevant if it ignores this claimed invention's sub-test(s) under § 112 or even §§ 102/103, too – i.e., the interpretation of § 101 is independent of that of the other 3 §§.

The Supreme Court's *Mayo* decision clarifies this evergreen issue of SPL precedents quite unmistakably: By showing, by a claimed emerging technology invention, that there is no such independency – as all these 4 §§ are logically tightly enmeshed in each other. I.e.: Testing its patent-eligibility without testing its meeting all §§ 112/102/103 requirements, is legally flawed.

As a side issue, the *Mayo* decision states also the inseparability of any claimed invention's whole SPL test as to its inventive concepts.

This inseparability is often harmless when dealing with MoT-type inventions. With claimed emerging technology inventions – the WTAB explains their new problems [5, 19] – the need increases of being aware, of both inseparability issues: Failing as to only one of the SPL requirements/concerns or inventive concepts devalues the whole SPL test, while this failure has absolutely no tangible or visually exact representation.

B) These inseparability problems of the whole §-wise SPL test are eliminated by its complete separability, enabling its complete "disaggregation"/"refinement" into a whole requirement-wise SPL test – being the logical conjunction of 10 "requirement-wise" alias "refined" alias "elementary" SPL sub-tests.

Thereby any refined SPL sub-test checks the claimed such invention for meeting exactly 1 of the 10 – today known and changeable by the Highest Courts' precedents, interpreting the 4 §§ 101/102/103/112. Hence, this invention's passing all 10 refined SPL tests is necessary and sufficient for its patent-eligibility and patentability.

A), B), and the subsequent arguments are focused on the following. A claimed invention's "self-contained" § 101 test does not exist. But, any § 101 test of it comprises testing, for a set of inventive concepts defining it, whether it meets – as to all its inventive concepts – all 10 elementary requirements stated by these 4 §§, as interpreted by the Highest Courts.

Pre-Mayo this scientific thinking – in terms of requirements to be met by a claimed invention and its claim, as required by the *Mayo* decision, disregarding where these 10 requirements are stated in these 4 §§ – was totally unknown. *Post-Mayo* it is mandatory, as required by the Supreme Court. And science bars any way back to ante quo, if attempted.

ARGUMENTS

The WTAB explained the all overarching significance of the notion of "inventive concept" introduced by the *Mayo* decision into the US SPL precedents. Concepts are apt for "disaggregation into their elementary concepts" and for the "separation of concerns", here: "separation of the requirements stated by SPL" [5]. The WTAB terminated by stating that proceeding in any claimed invention's § 101 test, as required by the *Mayo* decision, enforces the future consistency of SPL precedents, also if dealing with claimed emerging technology inventions.

But, WTAB did not yet address the inseparability problem inevitably encountered in a claimed invention's SPL test starting with using *Markman/ Phillips* first and only then considering *Mayo*. Then this inseparability namely implies: A claimed invention's test under § 101 is decided [11]

a) by SPL as a whole (I.e.: There is no test for a claimed invention's patent-eligibility that does not involve all 3 remaining §§ 112/102/103, too), and

b) by this claimed invention as a whole (I.e.: There is no test for its patent-eligibility not involving all inventive concepts making-up this invention),

both together being intellectually unmanageable.

Yet, it turns out that this problem a), caused by the total inseparability of the claimed invention's "whole compound as §-wise SPL test", is avoided by replacing the latter by its equivalent but completely separable "whole elementary/refined as requirement-wise SPL test", which also enables solving the inseparability problem b) as to its inventive concepts – explained in Section VII.

[16] addressed part of this § 101 phenomenon and called it the "... double-dipping approach to the patentable subject matter test ...". But in total, this phenomenon – arising in testing the patent-eligibility of a claimed invention, yet in truth being a SPL precedents problem – embodies

- not only approaching to the patentable subject matter being key to § 101, as seen by [16],
- but also checking 1.) the lawfulness of the definition of what at all is claimed by the claim (§ 112), 2.) the exclusion that the claim comprises an invention not claimed by the inventor in its specification and potentially still unknown (§ 112), and 3.) the nonidempotence of the invention (§§ 102/102/101).

These two bullet points indicate a "10-dipping approach", i.e. a "10 checks approach", to any legally relevant feature of the claimed invention. I.e.: The outcomes of these 10 dips/checks/refined-SPL-tests depend •on all inventive concepts of the claimed invention being lawful, •on its claim's well-definedness (= nonpreemptiveness), •on the claimed invention's patent-eligible creativity, and •on its nonidempotence.

Explaining this phenomenon – i.e. the preceding paragraphs – precisely and completely will establish the bulk of the subsequent argument. It will also explain the inevitably high but easily and completely controllable complexity of testing a claimed invention under § 101 – precisely: under the whole SPL – according to the *Mayo* decision.

Without meeting the *Mayo* decision's requirements, the interpretation of § 101, and hence testing a claimed emerging technology invention under it, is just an invitation of controversial though often well-founded opinions, as they just culminated within the CAFC – after several softer predecessors, already indicating this culmination. Of them here only WildTangent's question as to CAFC's *Ultramercial* decision[2] is discussed, as it exposes several "*Mayo* misunderstandings" of common interest.

Hence two remarks i) and ii) are in place: i) clarifying these 3 misunderstandings in *WildTangent's* interpretation of this CAFC decision, and ii) outlining the structure of the arguments in favor of *Alice's* Petition.

i) WildTangent's question in its Petition for Certiorari – and the criticism it embodies as to the *Ultramercial* decision – are based on two erroneous assumptions addressed below[2], and a third one nowhere else falsified, but being crucial for interpreting *Mayo* and an issue as to this CAFC decision.

WildTangent's third erroneous assumption is that the CAFC's decision had recognized only a single, initially non-patent-eligible inventive concept of a claimed Ultramercial method invention and it then "notionally upgraded" to a patent-eligible inventive concept of a claimed Ultramercial system invention, i.e. had changed this allegedly single inventive concept's "pragmatics" from being patent-noneligible to patent-eligible.

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[2] Let's ignore that an "abstract inventive concept" does not exist at all [19, p. 20, ftn 5] – rendering WildTangent's question obsolete, a priori. What then remains is, first of all, that the inseparability of a claimed invention under any SPL test, as explained in the Summary section, bars any answer to WildTangent's question: It has no answer, the finding of which would not involve testing this claimed invention also under all the other 3 §§ of 35 USC. I.e.: A thus separated § 101 test does not exist.

But – by contrast to WildTangent's assumption – any Ultramercial's claimed method invention comprises a whole series of "*Mayo*-type" inventive concepts (independent of its computer implementation). And, these are also clearly recognized as such by the CAFC's decision [1].

Nevertheless, WildTangent's Petition for Certiorari here also touches the above "double ditching" question [16]: The CAFC decision indeed confirmed the patent-eligibility of Ultramercial's claimed method invention only in conjunction with its implementation on a computer system.

According to the *Mayo* decision this indisputably means that the CAFC considered – without explicitly explaining this in its decision – these method inventive concepts as either a) being patent-noneligible or b) being not sufficing for its patentability. In both cases the inventive concept representing that this method is implemented on a computer system actually represents a powerful patent-eligible inventive concept, as it renders the system claim at issue either a) patent-eligible or b) patentable. The CAFC decision, self-identifying as being a § 101 decision, excludes b).

Yet, this view a) also is problematic – in a sense supporting WildTangent's as well as CLS's Petitions – due to the following consideration. The claimed system invention's property "is computer implemented" is modeled by a concept of this invention's, being independent of its method's inventive concepts – the CAFC recognized (implicitly).

The CAFC just as the claimed invention's specification are mute as to the question, what this additional concept adds to the claimed method's patent-eligible inventivity/creativity – as the *Mayo* decision requires to be evaluated. Nothing alike is presented by this CAFC decision.

This does not mean that the CAFC decision is inconsistent in itself or to the *Mayo* decision. It has only a presentation weakness, as the patent-eligible inventivity/creativity contribution of this "computer implemented system" concept is pretty evident – just as in this CLS case [1].

In case of granting these Petitions, it will be elaborated in more detail, in both cases, why this "computer system implemented" concept often, and in particular here, is indeed an inventive concept – as seen by advanced IT, interpreting the Supreme Court's *KSR/Bilski/Mayo* line of decisions, breaking new ground in SPL precedents. Though, it would also argue in favor of the patent-eligibility of their methods (of not-computer implemented inventive concepts) as they are useful, new, and no abstract ideas only, i.e. well-defined.

ii) The WildTangent aspects addressed in i) arise with any computer-system implemented and even any model based invention. They all are clarified by the below arguments – as seen by advanced IT interpreting the *Mayo* decision.

As the Supreme Court requires achieving this clarification on top of the *Mayo*-type inventive concepts based SPL construct of thoughts – i.e. construing a refined claim construction for it, as explained by the WTAB – all its elaborations are invoked, first, by quoting its Section numbers I-V, to some adding explanations carried over from it.

Thereafter, these elaborations are complemented by Sections VI-VII of this brief. They will show in more detail than provided above •) that the *Mayo* decision had to require – due to the 4 §§ of SPL and their logical interpretation – a claimed invention's whole "requirement-/aspect-/concern-wise" SPL test and •) what is checked by its 10 completely separated SPL sub-tests.

Section VIII invites all interested parties to communications about the advanced IT arguments presented here as to the present § 101 and more generally the SPL problem. While these advanced IT arguments retrace and light the scientific way, which the *Mayo* decision requires to be taken in emerging technology inventions' tests under SPL – here shown that on it consistency in SPL precedents inevitably is enforced – e.g. the 7 Amicus Briefs of the WildTangent case don't strive for this consistency enforcement but believe the Supreme Court's clarification of the notion "abstract idea" would establish it already.

I. see the WTAB [19]

II. see the WTAB [19]

III. see the WTAB [19]

IV. THE BEING OF INVENTIVE CONCEPTS

Due to the WTAB's word count limitations, some basic features of *Mayo*-type inventive concepts were not presented there, but here:

- An inventive concept of a claimed invention is not only one of its "technical facts", as disclosed by its patent(application)'s specification, but also the "legal fact" logically underlying it [19, p. 23]. Thus, an inventive concept is a claimed invention's legal fact establishing/embodying its respective technical fact, i.e. it represents a nested notional tupel.

  Inventive concepts hence are artificial notions representing the mental, jointly legal as well as technical building blocks of any patent. Every patent business practitioner actually does practically use them every day, when thinking about a patent – also if not being aware of them.
- Another issue is the relation of terms [19, ftn5)] to inventive concepts in patent(application)s, as terms are explicitly used in patent specifications' wordings, but inventive concepts hitherto usually not. But the *Mayo* decision's requirement statement for them implies that inventive concepts need not literally be quoted by patent specifications' wordings. *Mayo* implies even more: The names of inventive concepts may be freely chosen by the person analyzing the patent at issue, in particular such that it is self-descriptive in natural language (of the person of ordinary skill/creativity).
- Inventive concepts may be compound or elemen-

tary. Using a claimed invention's compound inventive concepts when testing it under the SPL of 35 USC is often misleading if not impossible [5]. Then disaggregating them into elementary inventive concepts is indispensable, which also greatly facilitates their checks under the SPL's different requirements/concerns (explained in the introductory remarks and leveraged on in Sections VI/VII).

But, there are several reasons, why for many claimed inventions – especially model based ones – also not all their (subject matter) creative elementary concepts are suitable for its inventive concepts (e.g. as not being independent and/or the sequence of discussing their disclosures may matter [5]).

[5] also shows that there are several additional logical, systematical, and psychological reasons, which would be felt by the average patent law practitioner as making a refined claim construction – based on *Mayo*-type inventive concepts – much more conclusive, purposeful, and natural than a classical claim construction.

The psychological meanings of the notions of "inventive concept as such" and in particular of "inventivity as such" of a claimed invention – the notion of inventivity being embedded by the notion of inventive concepts describing it and exceeding in its semantics the a posteriori formal definition provided in the WTAB and [5] – is not elaborated on, here. But its tight relation to SPL has been clarified in [6,7], based on a German Highest Court's decision, i.e. induced by the BGH. It in principle counts this inventivity (of a claimed invention) by the number of independent ideas its inventor must have created prior to finding it over prior art and skill. This notion of the BGH – it does not yet embody the legalistic aspects represented by the *Mayo*-type inventive concepts, too – in principle coincides with the *KSR*'s notion of creativity and with *Mayo's* creative concept embodied by any one inventive concept. This creative concept then basically is nothing else but the solid representative of an independent creative flighty idea, i.e. models the latter precisely by an even property of the element it refers to – to be taken with sufficient caution [5,6,7,11,19].

V. *MAYO* ENFORCES CONSISTENCY AND PREDICTABILITY IN SPL PRECEDENTS

While much of this issue has been discussed in the WTAB, two more implications may be of interest.

- Having learned the lesson provided by the *Mayo* decision, looking at the "classical claim construction" with a minimum of scrutiny, it turns out to be fragmental and not goal-oriented, i.e. just antiquated in its today by advanced IT avoidable lack of conciseness – not at all apt to enforcing this consistency, in particular as to claimed emerging technology inventions.
- There is quite another achievement implied by the Supreme Court's *Mayo* decision: Eclectic efforts, such as the *KSR/Bilski* cases' TSM/MoT tests or other AI alikes, is obsolete – just as the USPTO's strange BRI of claims [14,21,5,9,15]. They namely do not enforce consistent/predictable SPL precedents, as the *Mayo* decision does – not to speak of its inducing semi-/fully-automatically construing a claimed invention's refined claim construction, when exploratively resp. conformatively testing it under SPL [11,5].

These deficiencies apply especially to the evergreen "threshold" test as patent-eligibility test for a claimed emerging technology invention: With such inventions it represents the end of any rationality in deciding their patent-eligibility. Consistency – here just another word for the rationality of science – is hence not achievable in SPL precedents deprived of rationality.

VI. *MAYO* IMPLIES DISAGGREGATING THE 4 COMPOUND SPL REQUIREMENTS INTO TODAY'S 10 ELEMENTARY ONES, AND: ALL THESE ELEMENTARY SPL CONCERNS ARE CHECKED BY THE 10 SPL TESTS

The Supreme Court's decisions clearly require that patent precedents cater to needs of the sectors of economy based on innovations, i.e. on emerging technologies. In *Mayo* it hence required warranting – as part of testing under 35 USC's SPL a claimed emerging technology invention – that

i.) its claim is not preemptive[3], which is equivalent[4] to warranting that its claimed invention represents not an "abstract idea" only – here suggested to check its meeting this requirement by the NAIO test10) – and

ii.) its claimed invention does embody an amount of patent-eligible creativity deserving patentability, due to at least one patent-eligible inventive concept disclosed by its specification, i.e. one or several such inventive concepts – here suggested to check its meeting this requirement by the NANO test7), assessing its patentability unless being idempotent9)).

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[3] For the mathematical definition of "preemptivity" see [5, Def 5]; see also WTAB [19, ftn.4].

[4] This equivalence is warranted by [5, Theorem 3].

In particular i.) means: The *Mayo* decision requires in testing such a claimed invention as to its meeting the 10 SPL requirements (= the 10 legal concerns of §§ 101/102/103) does comprise testing it as to SPL requirements hitherto partially ignored or unknown. I.e.: Such tests, too, are to be comprised by construing the refined claim construction for it.

Seen historically, the Supreme Court's line of KSR/Bilski/Mayo decisions – being of increasing scientificity, as any insight of them builds on top of its predecessor – took the "SPL know how" to a much higher level of development, not only in the US but internationally, than that it was on before *Mayo*.

This higher level of development is characterized by the *Mayo* decision's now unmistakable requirement – only seemingly being new but in truth embodied already by the 10 concerns of the 4 §§ 101/102/103/112 – to check within the patent-eligibility test of a claimed such invention alias a complete set of its inventive concepts5)), whether • its claim/ claimed invention is "nonpreemptive" (requiring checking all its inventive concepts, their patent-eligible and non-patent-eligible ones, i.e. its "total" creativity5) – the legal requirement of this check is clarified by the end of Section VII), and • its patent-eligible inventive concepts are sufficient for qualifying it patentable, whereby the Supreme Court

- by its *Bilski* decision already required that such a claimed invention must not be an "abstract idea" only, by not having developed or disclosed or defined the claimed invention to a degree that also the scope of the claim claiming it is precisely defined, i.e. its preemptivity is excluded (see VII5));
- by its *KSR* decision hinted already at the potential idempotence9) of a so identified amount of paten-

table creativity, identified by this set's patent-eligible inventive concepts.

Therefore, for a claimed invention, this line of Supreme Court decisions required in increasing clarity to refine the classical § 112 claim construction – at least for model based claimed inventions, such as *Bilski* and *Mayo* – by identifying a set of inventive concepts and assessing their lawful disclosures by § 112, its completeness[5)] and nonpreemptivity[10)] by § 101, their patent-eligible creativity[7)] by §§ 102/103, and their nonidempotence[9)] by § 101.

Accordingly, the CAFC made a move, by questioning the § 112 classical claim construction as to its "aspects" in the light of the *Mayo* decision. Such aspects, the CAFC asked for [10], are exactly the impacts of these *Mayo*-type inventive concepts on this invention's tests under these 3 §§ – though in [17] the CAFC did not discuss these aspects, unfortunately. Nevertheless one may assume that, by its aspects the CAFC, too, took notice of the SPL's "elementary concerns" to be taken care of in a claimed inventions patent-eligibility and patentability test – as the Supreme Court identified/described them by its § 101 interpretation in its *Mayo* decision.

Anyway, the claimed invention is patentable and patent-eligible if and only if all these 10 "CAFC aspects" alias the "Supreme Court's elementary 35 USC SPL concerns/requirements" are met by the claimed invention – whereby it actually needs clarification whether all 10 aspects/concerns/requirements indeed represent both Highest Courts' views at SPL precedents. It is evident that these aspects/requirements are the same for all claimed inventions, while the tests whether they are met by it are depending on its (complete set of independent) inventive concepts, which are(is) not necessarily unique for it.

For a claimed invention, these 10 "CACF aspects" alias "Supreme Court's elementary SPL concerns" – in regard of which its refined claim construction is to be construed under their respective 10 refined SPL (sub-)tests, tests 2-10 being executable iteratively and in arbitrary sequences, but all 10 test eventually to be passed one complete set of inventive concepts – are (keeping in mind the just mentioned missing confirmations): With

- § 112, the "well-definedness of these inventive concepts", i.e. their being 1) disaggregated into elementary inventive concepts, and their uses in §§ 102/103/102 are being disclosed 2) lawfully, 3) definitively, and 4) enablingly;
- §§ 102/103, the "novelty/nonobviousness of the invention", i.e. their 5) independence, and 6) non-equivalence, and its 7) sufficient amount of patent-eligible inventivity;
- § 101, the "patent-eligibility of this invention", i.e. its not being 8) only one or several natural phenomenons, or 9) idempotent, or 10) an abstract idea only alias its claim being preemptive.

For these 10 "CAFC-aspects" [10] holds: Construing a classical claim construction ignores of aspects 2)-4) of the claimed invention's inventive concepts that these must meet also the "§§ 102/103/101 aspects", i.e. the aspects 5)-10) – while a refined claim construction warrants that these inventive concepts meet, in addition to aspects 2)-4), also the aspects 5)-10), i.e. they meet the limitations imposed on its test under §§ 102/103/101, too. Warranting this is easily (semi-)automatically possible iff testing aspect 1) also delivers "true", i.e. all these inventive concepts are disaggregations of original compound ones into elementary ones [19,11,5,15].

VII. THE 10 SPL SUB-TESTS *MAYO* INDUCES

The preceding Section showed the *Mayo* decision's insights – and their historic development – into the requirements stated by the 4 §§ 101/102/103/112 and to be met also by a claimed emerging technology invention for being granted patent law protection. Thus, the *Mayo* decision had to require, by logical reasons and the SPL of 35 USC, for this invention its "10 requirements-/aspects-/concerns-wise" SPL sub-tests just identified – whereby the first part of this brief showed that they are separable, i.e. straightforward executable [11].

The below sequence of 7 explanatory steps now becomes specific about what must be checked by the 10 separate refined SPL tests. It only touches solely the key *Mayo* notion of an "abstract idea" [5].

These 10 checks may be executed highly iteratively and in arbitrary order, for meeting the *Mayo* decision's requirement that a below set S and its elements (not necessarily unique) pass them all. Note: This sequence shows the amazing interrelations between these "CAFC-aspects" [10] – clarified therein.

1) Test 1 ("T1") checks the disaggregation of any inventive concepts into conjunctions of elementary/concern-separated ones, explained above [19,5].
2) The T2-T4 assess that these inventive concepts meet the requirements stated by the *Markman/Phillips/Noah* decisions.
3) The T5-T6 assess that the remaining 4 tests T7-T10 are performed by using a set S of inven-

tive concepts passing T1-T4 and comprising only independent[5)] and non-equivalent[6)] elements.

4) T10 assesses that S passes the NAIO test[10)], i.e. that the claimed invention is "not an abstract idea only". The claimed invention resp. its claim – then defined by S – is "nonpreemptive"[3)].

   Mathematical KR shows the nonpreemptivity of it resp. its claim is an invariant over all existing sets S – for nonpathological claimed inventions with First Order Logic inventive concepts [5], i.e. for probably all inventions hitherto.

5) Then T8 assesses[8)] that the set S^{pe} of S'es patent-eligible inventive concepts is $\neq\Phi$. Then the claimed invention is "principally patent-eligible".

6) Then T7 assesses that S^{pe} passes the NANO test, i.e. that the claimed invention is patentable[7)].

7) Then T9 assesses[9)] that the claimed invention is nonidempotent – it then is patent-eligible, too.

These very short descriptions of the semantics alias CAFC-aspects [10] of the sub-tests T5-T10 need at least the explanations provided by[5),6),7),8),9),10)] and the below bullet points, before clarifying the ubiquitous "abstract idea" uncertainty in interpreting § 101 – in Section VIII discussed in its principle significance as compared to the advanced IT arguments provided here.

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[5] The notion of "independency" means: None of the inventive concepts is implied by the other ones [5]. A set of inventive concepts is called "complete", if it passes step 2 of the NAIO test[10)].

[6] The notion of "equivalence" of inventive concepts means they are different from each other but only in a legally irrelevant sense as – almost? – useless (and is scientifically not yet completely clarified as to its relations to "idempotence", the definition of a claim's scope, and "equivalent inventions").

- All these considerations are indispensable in an unquestionable SPL test of a claimed emerging technology invention,8),9)).

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[7] The "NANO test" basically comprises 4 steps, checking all "anticipation combinations, ACs" of S derivable from any prior art documents' invention:

1) generating the ANC matrix, its lines representing for any prior art document its invention, and its columns representing the elements of S;
2) generating, for any entry in the ANC matrix, its "Anticipates/Nonants/Contradicts" relation;
3) automatically deriving from the ANC matrix the {AC} with the minimal number Q^{plcs} of NC-entries;
4) automatically delivering <Q^{plcs},{AC}> as the indication of the claimed inventions patent-eligible creativity over the prior art docs.

[8] T8 does not yet decide by assessing $S^{pe} \neq \Phi$ that the claimed invention is patent-eligible, as it still may be idempotent. This is assessable only after its NANO test – determining $Q^{plcs}>0$, otherwise it is not novel – delivered its {AC} for this check.

[9] T9 deals with the phenomenon that – although the NANO test determines $Q^{plcs} \gg 0$ for the claimed invention – due to "near equivalences" or "near exceptional pragmatics" or "lack of problem specificity or 20-year-solvability or self-existence" or other exceptional conditions. See bracket in ftn6).

- By hinting into their direction the *Mayo* decision has not opened a Pandora's Box, but has shut it: All these legal aspects and all their puzzling and dizzying interrelation now are stereotypic and simple and hence apt to be taken care of automatically, requiring Highest Courts' decisions refining the *Mayo* decision as to some issues in[5)-10)].
- While hitherto some of these issues have not even been thought of, the *Mayo* decision provides – especially by its notion of "inventive concept", as explained in WTAB [5] – the fundamental guidance for how to elaborate on them. The *Mayo* decision's other clear guidance providing key notion – qualifying a claimed invention as "abstract idea" – is explained next.

Firstly: Many inventions/innovations undergo a "status nascendi". Two famous examples from mathematics/physics are "complex functions" and the "energy operator", which both could not get out from this blurring state for years – during this period causing many controversies among scientists – until Gauss resp. Hilbert saw the deficiencies to be removed from them: In both cases incomplete definitions of what these inventions were thought to be.

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[10] The "NAIO test" basically comprises 4 steps [5]:
1) verifying that the specification of the claimed invention discloses a problem, P.0, described to be solved by it, the latter being described by S;
2) verifying, using the inventive concepts of S, that the claimed invention solves P.0;
3) verifying that P.0 is not solved by the claimed invention, if therein an inventive concept of S is removed or relaxed;
4) if all verifications 1)-3) apply, then this claimed invention is "not an abstract idea only".

Secondly: The Supreme Court replaced "status nascendi" by – in the patenting context – better term "abstract idea" for this blurring as incompletely defined invention in this state. Indeed then just an "abstract idea" exists of this invention. I.e.: The term "abstract idea" precisely describes its state. A patent granted to such an abstract idea would be "preemptive": Its scope of monopoly definitively comprises inventions not thought of by the inventor – as not disclosed by the resp. inventive concept in its specification10) – which he/she therefore does not deserve.

Thirdly: The NAIO test10) assesses a claimed invention is nonpreemptive – i.e. is not an "abstract idea" only – by checking the problem is identified it is invented to solve and all inventive concepts are indispensable. It thus impedes its creation in no way.

VIII. 7 AMICUS BRIEFS' APPROACH TO PATENT-ELIGIBILITY IN WILDTANGENT

As to the Mayo decision's interpretation of § 101, hitherto no notice has been taken publicly – by the community of patent law firms interested in this interpretation – of the advanced IT arguments presented here, which retrace/light the scientific way the *Mayo* decision requires to be taken in testing emerging technology inventions under § 101.

The WildTangent Petition's 7 Amicus Briefs are exemplary: Anyone tells right from its outset that it clings to misunderstandings of the *Mayo* decision (as identified in [19], yet here even worse). These misunderstandings bar it from thinking twice about the clear requirement statements comprised by the *Mayo* decision and their implications as to the interpretation of § 101. They even made it immediately jump onto exactly one of the *Mayo* decision's crucial but secondary terms, namely "abstract idea", thereby completely ignoring that the *Mayo* decision's crucial primary term is "inventive concept" and that it uses further new key terms, such as "preemptive".

None of these three terms has any meaning in classical SPL precedents – and uneasiness about the latter has repeatedly been conveyed by the Supreme Court's *KSR/Bilski/Mayo* decisions. Hence the meanings of these new *Mayo* terms got to be determined in a generic sense such that the *Mayo* decision's wording identifies a clean way out from the current SPL dilemma, which the Supreme Court surely both had in mind when "word-smithing" this decision. But this kind of determining these terms' meanings didn't happen!

Not because this is a farfetched idea. Quite the contrary: It is nearby – by just looking into one of the presently most popular areas of research, namely advanced IT [2], where the term/notion of "concept", as used by the Mayo decision, is known since decades [3,4,19,5]. Then advanced IT may derive from the *Mayo* decision – and in view of the common knowledge that most inventions undergo the evolutionary process (as outlined by the end of Section VII) – the meaning also of the term "abstract idea" (as also outlined in VII) and that of "preemptive", as shown in the WTAB [5,19] and elaborated on here. Hence, broadly interpreting the *Mayo* terms by these established meanings should have been obvious.

Instead, the untenable belief prevails in great breadth – also with these 7 Amicus Briefs, if their uncertainties are ignored – that the Supreme Court and/or the CAFC could reestablish the missing consistency in SPL precedents by a simpler alternative to the *Mayo* way.

- The theoretical alleged such alternative were the *Mayo* decision's interpretation within the classical pre-*Mayo* SPL paradigm. But this is logically impossible, as noticed already by WTAB [5,15,19].
- The practical alleged option were to achieve consistency the administrative way by imposing on all judges some absolutely binding directive waving rationality therein and also in their freedom to decide. This option is constitutionally impossible.

Thus, the only viable way to consistency in SPL precedents is the basically scientific one suggested by the Mayo decision, as interpreted by advanced IT.

Unperturbed by such very basic thoughts, inevitably induced by the Supreme Court's *KSR/Bilski/Mayo* line of decisions: Hitherto the classical SPL doctrine remains undisputed, though untenable in the future – namely that consistency in SPL precedents, also as to claimed emerging technology inventions, is achievable without taking the classical SPL doctrine/paradigm to a higher level of evolution, as required by the *Mayo* decision to this end.

Consequently, the 7 Amicus Briefs – full of excellent ideas about the reasons of the current patent-eligibility dilemma and about its detrimental impacts on economy – suggest solutions for its resolution by coming forward with their individual opinions on the meaning of the term "abstract idea", though not explaining why these should enforce consistency of SPL precedents.

Due to this tunnel vision on the today's problem of § 101 precedents, it is logically impossible to recognize that – whatever their notions of "abstract idea" are – there is no way of testing a claimed invention under § 101 without also testing it under §

112/102/103, as shown above. I.e., that no "self-contained" patent-eligibility test exists, at all.

It may well be that a broader awareness of the big step forward in SPL precedents, achieved by the Supreme Court's *Mayo* decision, will emerge only when an Internet server will provide a so enabled "Patent Technology" service – to begin with: "SPL Technology" service – and thus demonstrate its by *Mayo* enabled amazing practical as well as legal power [5,9].

CONCLUSION

The WTAB [19] already stated that the Supreme Court's *Mayo* decision managed to overcome – by proceeding exactly as advanced IT would do – by its (implied) refined claim construction the deficiencies of the classical claim construction and in its wake the dilemma of inconsistency of SPL precedents as to claimed emerging technology inventions.

This Amicus Brief supports CLS's basically concurring Petition to WildTangent's one. It hence continues in providing advanced IT evidence that the Mayo decision required way of avoiding such dilemmas is not only by Constitution indispensable, but also that Mayo puts US SPL precedents on a solid as scientific basis and being future proof as economically sound in any regard – thus clearly promoting innovations in emerging technologies [20].

This would rapidly impact on all national/regional patent systems worldwide, as today beneficial advanced IT based progress spreads internationally – reminding where it came from.

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AMICUS
CURIAE
BRIEF

RECORD
AND
BRIEFS

No. 13-298

In the
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL, *ET AL.*,
Respondents.

**On Petition For A Writ Of Certiorari
To The United States Court Of Appeals
For The Federal Circuit**

BRIEF OF *AMICI CURIAE* TRADING TECHNOLOGIES INTERNATIONAL, INC., *ET AL.*, IN SUPPORT OF PETITIONER

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STATEMENT OF INTEREST OF *AMICI CURIAE*

Amici curiae are companies that are directly impacted by the uncertainty created by the Federal Circuit's decision in *CLS Bank International v. Alice Corporation*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc) regarding the patentability of claims under 35 U.S.C. § 101, including patents directed to computer-implemented inventions, such as computer software and hardware patents.[1] *Amici* have a strong interest in ensuring that the U.S. patent laws, and the rules of the U.S. Patent & Trademark Office ("USPTO") based on those laws, are interpreted correctly and provide for a clear and effective patent system.

Collectively, *amici* have invested significant amounts of money on research and development of innovations in their respective fields and new products and services for their businesses. Many of the *amici* rely on their patent portfolios to protect those investments, and have licensed and/or asserted patents. Likewise, many of the *amici*, including those who have asserted patents, have been sued for patent infringement, and need to be able to reliably evaluate the patents of others in order to make business decisions. If fundamental issues relating to the scope of the threshold question of patent eligibility for many inventions remain uncertain, *amici's* ability to operate their businesses efficiently and effectively will be impaired. This uncertainty will jeopardize future investments in products and services and will make it difficult to ascertain which markets to enter and which to leave to incumbents.

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[1] Letters of consent to the filing of this brief have been lodged with the Clerk by all parties. All parties' counsel received timely notice of the intent to file this brief. *See* SUP. CT. R. 37.2. No counsel for any party authored this brief in whole or in part, nor did any person or entity, other than the *amici*, their members, or their counsel, make a monetary contribution to the preparation or submission of this brief. *See id.* 37.6. The undersigned counsel have filed applications for admission to the Bar of this Court, which applications are pending.

Amici include: Trading Technologies International, Inc.; CME Group Inc.; Bancorp Services, LLC; Regulatory DataCorp; CoreLogic; Aristocrat Technologies Australia Pty. Ltd.; Casino Gaming, LLC; Charles River Analytics Inc.; Architecture Technology Corporation; Great Lakes NeuroTechnologies Inc.; Miramar Labs, Inc.; NeuroWave Systems Inc.; Flocel Inc.; Cleveland Medical Devices Inc.; Orbital Research Inc.; TIP Solutions, Inc.; MONKEYmedia, Inc.; Chief Experience Officer, Inc.; Horizon Digital Finance LLC; Extraordinary Re Holdings, Inc.; DDB Technologies LLC; and RedTxt.com.au Pty. Ltd. For a description of *amici, see* Appendix 1a.

Alice Corp.'s Petition presents an opportunity for this Court to bring clarity to a critical issue impacting many patents – the boundaries of patent eligibility under 35 U.S.C. § 101. Accordingly, *amici* request that this Court grant the Petition.

SUMMARY OF ARGUMENT

Because this case presents an issue of great importance affecting many patents, Alice's Petition should be granted. The case below has created unacceptable confusion and uncertainty on the important question of what patent claims are patent-eligible under 35 U.S.C. § 101. In particular, the Federal Circuit has created uncertainty and confusion regarding what it means to be an "abstract idea" (one of the judicially-created exceptions to patentability under Section 101) and when claims to computer-implemented inventions (that are not directed to a law of nature, natural phenomenon, or mathematical formula) are patent-eligible subject matter under Section 101. This uncertainty impacts thousands of patents, including patents directed to computer-implemented inventions. Parties on all sides of the merits are in agreement that the current state of the law is so confused that the outcome of a Section 101 analysis for many patents (at either the United States Patent and Trademark Office or in the courts) is completely unpredictable and arbitrary. This unpredictability extends even to the Federal Circuit, where there is no consensus among a majority of the judges and outcomes are panel-dependent. This unpredictability has evidenced itself in even the short period since the decision below. Since then, different panels at the Federal Circuit have reached irreconcilable results in different decisions. In addition, since the decision below, the USPTO has taken its own approach to the question of patent eligibility of computer-implemented inventions. This Court should grant Alice's Petition to bring clarity regarding the metes and bounds of 35 U.S.C. § 101.

ARGUMENT

I. *CLS Bank v. Alice* Has Created Confusion and Uncertainty Regarding the Scope of Patentability Under 35 U.S.C. § 101, Including for Computer-Implemented Inventions.

The issues presented by 35 U.S.C. § 101 have never been simple. However, in the past few years, several important and closely-watched decisions of the Federal Circuit have further confused the law in this area. The en banc Federal Circuit recently tried to clarify the law in *CLS Bank International v. Alice Corporation*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc), but instead ended up confusing the law further. Numerous commentators have recognized that the Federal Circuit has hopelessly muddied the waters regarding the patentability of computer-implemented inventions, such that the patentability of any given patent now hinges on the particular composition and personal predilections of a given Federal Circuit panel. As such, when evaluating whether their own or a competitor's patent is ineligible for patentability under Section 101 for being merely directed to an "abstract idea," market participants are now faced with a legal landscape that is uncertain and unmanageable.

35 U.S.C. § 101 defines the subject matter that may be patented under the Patent Act: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." This Court's precedents provide three narrow, judicially-created exceptions to

Section 101's broad patent-eligibility principles: "laws of nature, physical phenomena, and abstract ideas." *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010). In *Bilski*, this Court held that the machine-or-transformation test is not the sole test for determining the patent eligibility of a process, but rather "a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101." *Id.* at 3227. This Court therefore found that claims that do not recite a computer element should not necessarily be deemed ineligible under Section 101. *Id.* at 3227-28.

Immediately after this Court decided *Bilski*, the conventional wisdom was that a patent claim that recited tangible elements (such as computer-related elements) could not be deemed to merely be directed to an "abstract idea" (at a minimum, it was directed to an application of an "abstract idea") and therefore typically did not raise patent eligibility concerns under Section 101.[2] After *Bilski*, the main area of uncertainty with respect to the "abstract idea" exception to patent eligibility resided in how to determine if a claim that does not clearly recite tangible elements, such as computer elements, was too "abstract" to pass muster under Section 101.

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[2] This Court has issued several decisions in which it found that claims could fail under Section 101 even if the claims recite clearly tangible elements (*e.g.*, computer elements) where such elements were found to be superfluous. In each of these cases, the claims at issue were directed to laws of nature, natural phenomena, or mathematical formulas. *See Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Parker v. Flook*, 437 U.S. 584 (1978); *Diamond v. Diehr*, 450 U.S. 175, 182 (1981); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012). There has not been a decision of this Court applying the rationale of these cases to claims not directed to a law of nature, natural phenomenon or mathematical formula.

In the years since *Bilski*, there have been several decisions at the Federal Circuit that have caused further confusion over Section 101 with respect to the "abstract idea" exception. Different panels of the Federal Circuit have applied different patentability standards and have reached divergent results regarding similar patents directed to computer-implemented inventions, including claims that recite tangible hardware elements. The end result is that the patentability of a given claim is arbitrary because it does not hinge on the uniform application of a coherent body of law. This unfair situation has gotten so bad that one Federal Circuit panel recently alluded to the "murky morass" and "swamp that is § 101 jurisprudence" in the Federal Circuit. *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1260-62 (Fed. Cir. 2012).

For example, some panels have found computerized method, computer-readable medium, and computer system claims unpatentable under Section 101 because they were "abstract," even though they recited tangible computer elements and were not directed to laws of nature, natural phenomena, or mathematical formulas. *See CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1376-77 (Fed. Cir. 2011) (concluding that a computer system for detecting fraud in a credit card transaction over the Internet was not patent-eligible under Section 101); *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1317 (Fed. Cir. 2012) (concluding that claims directed to a "computer-aided method and system . . . for processing credit applications over electronic networks" were directed to an abstract idea and therefore not patent-eligible); *Bancorp Servs., LLC v. Sun Life Assurance Co.*, 687 F.3d 1266, 1281 (Fed. Cir. 2012), *appeal docketed*, No. 13A185 (U.S. Aug. 13, 2013)[3] (concluding that claims directed to a computerized system for administering a stable value protected life insurance policy were directed to an abstract idea and therefore not patent-eligible). None of these decisions finding claims ineligible under Section 101 articulate a clear definition of what it means for a claim to be merely directed to an "abstract idea."

In contrast, other panels have found computer-implemented inventions patent-eligible under Section 101. *See Research Corp. Tech., Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010) (concluding that it perceived nothing abstract in the subject matter of the processes for an improved method of computing data used for grey-scale printing on a black-and-white printer); *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1325 (Fed. Cir. 2011) (concluding that a computerized method for distributing copyrighted products over the Internet constituted a patentable application rather than an unpatentable abstract idea), *vacated*, 132 S. Ct. 2431 (2012), *aff'd on remand*, 722 F.3d 1335 (Fed. Cir. 2013); *CLS Bank Int'l v. Alice Corp.*, 685 F.3d 1341 (Fed. Cir. 2012) (finding that computer-implemented claims for performing financial settlements in a particular way that mitigates or eliminates risk, including claims drawn to methods, computer-readable media, and systems, were not abstract ideas and thus were all patent-eligible under Section 101), *vacated*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc).

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[3] On August 14, 2013, the Chief Justice granted an application to extend the time to file a petition for a writ of certiorari to November 8, 2013.

Apparently in an attempt to resolve this conflict, the en banc Federal Circuit decided to consider and resolve the following questions in *CLS Bank v. Alice*: "What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible 'abstract idea;' and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent-ineligible idea?" 717 F.3d at 1293. As might be expected given the issue's importance, the en banc court's decision to review this issue received considerable attention from the patent bar at the merits stage. At least 24 *amicus* briefs were submitted with varying opinions and views on the merits.

Unfortunately, the Federal Circuit's decision only further confused the law. The decision was a one-paragraph *per curiam* opinion upholding the lower court's decision to find the claims at issue ineligible under Section 101. There was no majority agreement on any test or rationale. The Federal Circuit split into at least three separate camps regarding the proper analytical approach to the patent eligibility question for computer-implemented inventions, and the Court issued six separate opinions (not counting the "additional reflections" noted separately by the Chief Judge). The plurality camp believes that the Section 101 subject-matter analysis should include an analysis of novelty and non-obviousness over prior art of the sort done under 35 U.S.C. §§ 102 and 103, as well as an analysis of whether a claim "preempts" an "abstract idea."[4] Another camp vehemently disagrees with mixing a Sections 102 and 103 analysis in a Section 101 analysis as going against the plain language of the statute and as contradicting this Court's precedent in *Diamond*, which stated that "[t]he 'novelty' of any element or steps in a process . . . is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." 450 U.S. at 188-89. A third camp believes that a claim reciting tangible computer elements, by definition, cannot be considered as being merely directed to an "abstract idea." Notably, none of the opinions even offered a clear or direct answer to the core issue originally identified by the en banc court – what does it mean to be "abstract"?

Regardless of one's views on the underlying substantive issues, parties on all sides are in agreement that the current state of the law, as reflected in the decision below, is untenable. This is evidenced by the following comments on the Federal Circuit's decision from the patent bar and academia:

- "Unfortunately, the Federal Circuit's decision did nothing to provide clarity and, in fact, perhaps made the interpretation of § 101 more uncertain." Michael

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[4] This "preemption" analysis is similar to the analysis done by this Court in its previous decisions dealing with claims directed to a law of nature, natural phenomenon, or mathematical formula. There is a split between different camps regarding whether this Court's rationale in these cases should apply to the general question of whether a claim is directed to an "abstract idea" where that claim is not directed to a law of nature, natural phenomenon or mathematical formula.

L. Kiklis and James Love, *Is the Federal Circuit's* CLS Bank v. Alice Corp. *Decision a Cry for Help from the Supreme Court?* 30 THE COMPUTER & INTERNET LAWYER 1, OBLON (Aug. 2013), http://www.oblon.com/sites/default/files/news/Is%20the%20Federal%20Circuit%E2%80%99s%20CLS%20Bank%20v.%20Alice%208.13.pdf.

- "In an ironic twist, the result [of the *en banc* decision] is something more akin to Alice in Wonderland than the clear guidance patent practitioners were hoping for." Robert Wagner, *Is Software Patentable? Fed Circuit Isn't Sure* – CLS Bank v. Alice Corp., PIT IP TECHBLOG (May 21, 2013), http://pitiptechblog.com/2013/05/21/is-software-patentable-fed-circuit-isnt-sure-cls-bank-v-alice-corp/.
- "'The law of patentable subject matter is such a mess,' said Jeff Lewis of Patterson Belknap Webb & Tyler LLP [the president of the American Intellectual Property Law Association]. 'Nobody knows what patentable subject matter is these days.'" *Software Patent Mess Hits High Court with WildTangent Case*, LAW360, http://www.law360.com/articles/467562/software-patent-mess-hits-high-court-with-wildtangent-case.
- "In what can only fairly be characterized as a patent tragedy, the United

States Court of Appeals for the Federal Circuit now has no official position on the patentability of system claims that objectively recite volumes of tangible structures that clearly satisfy the machine-or-transformation test." *Federal Circuit Makes Mess of Software Patents*, PRACTISING LAW INSTITUTE (May 13, 2013, 16:38), http://patentlawcenter.pli.edu/2013/05/13/federal-circuit-makes-mess-of-software-patents/.

- "Truthfully, all the important questions that we thought might be answered remain completely and totally unanswered because there were only 10 judges who sat on the *en banc* tribunal and no more than 5 judges signed on to any one opinion." Gene Quinn, *Federal Circuit Nightmare in* CLS Bank v. Alice Corp., IPWATCHDOG (May 10, 2013, 1:26 PM), http://www.ipwatchdog.com/2013/05/10/federal-circuit-nightmare-in-cls-bank-v-alice-corp/id=40230/.

- "Today, the Federal Circuit handed down a 135-page decision in an effort to set the record straight on what can and cannot be patented under § 101 of the Patent Act. Unfortunately, the ten judges could only agree on 55 words." Julie Samuels, *Hey, Supreme Court? It's Time To Take Up Software Patents (Again)*, ELEC. FRONTIER FOUND. (May 10, 2013), https://www.eff.org/deeplinks/

2013/05/hey-supreme-court-its-time-take-software-patents.

- "The issue of patentable subject-matter eligibility has been in considerable flux. Currently, it's unclear whether adding computer limitations to an otherwise unpatentable concept somehow renders the concept patent eligible. The Federal Circuit tried to settle this question when the entire court heard *CLS Bank Int'l v. Alice*, 717 F.3d 1269 (Fed. Cir. 2013). But the judges could not find common ground and the decision contained seven separate opinions reflecting at least three distinct approaches. Now it has been suggested that the *CLS Bank Int'l* provided the lower courts with absolutely no guidance." Bernard Chao, *Interpreting* CLS Bank Int'l v. Alice, PATENTLY-O BLOG (Sept. 3, 2013, 3:08 PM), http://www.patentlyo.com/patent/2013/09/interpreting-cls-bank-intl-v-alice.html.

- "If anything, the court's fragmented decision creates further confusion in an area of patent law already mired in conflicting, confusing, and often contradictory precedents." *Unclear If* CLS Bank v. Alice *Really Will Be the "Death of Hundreds of Thousands of Patents,"* DORSEY & WHITNEY LLP (May 22, 2013),http://www.dorsey.com/eu_ip_cls_bank_alice_patents/.

- "In the end, patentees are still without a solid answer as to how far Section 101 reaches to disqualify software or business-method patents as 'abstract ideas.'" Brie L.B. Buchanan and Angela Holt, CLS Bank v. Alice Corp.: *Section 101 Patent Eligibility: New Federal Circuit Decision Clarifies Nothing*, BRADLEY ARANT BOULT CUMMINGS LLP (May 24, 2013), http://m.babc.com/cls-bank-v-alice-corp-section-101-patent-eligibility-new-federal-circuit-decision-clarifies-nothing-05-24-2013/.

II. Since *CLS Bank v. Alice* Was Decided, There Have Already Been Irreconcilable Decisions at the Federal Circuit and the USPTO.

A. Different Panels at the Federal Circuit Apply Different Patentability Standards to Computer-Implemented Inventions After *CLS Bank v. Alice*.

Recent decisions of the Federal Circuit, subsequent to the en banc decision in this case, further highlight the need for this Court to grant *certiorari* in this case. The outcomes in these cases and the rationale used by the different panels are irreconcilable. In one instance, after this Court granted *certiorari*, vacated, and remanded a previous Federal Circuit decision, the Federal Circuit panel in *Ultramercial* held on remand that method claims directed to monetizing and distributing copyrighted products over the Internet are patentable under Section 101. *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013), *petition for cert. filed*, 2013 WL 4495981

(U.S. Aug. 23, 2013) (No. 13-255). The approach of the *Ultramercial* panel tracks in several significant respects the approaches of Chief Judge Rader and Judges Linn, Moore, O'Malley, and Newman in *CLS Bank v. Alice*. The court rejected the idea of dissecting the claim and ignoring "old elements" that are routine or conventional. *Id.* at 1344. Notably, the court recognized "that any claim can be stripped down, simplified, generalized, or paraphrased to remove all of its concrete limitations, until at its core, something that could be characterized as an abstract idea." *Id.*

However, in another recent decision, the majority of another Federal Circuit panel appears to have used a different approach than the *Ultramercial* panel. *Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, No. 11-1486, 2013 WL 4749919 (Fed. Cir. Sept. 5, 2013). The approach of the *Accenture* majority tracks in several significant respects the approaches of Judges Lourie, Dyk, Prost, Reyna, and Wallach in *CLS Bank v. Alice*. In this case, the court affirmed a decision finding a claim directed to a computer-implemented system for generating tasks based on rules to be completed upon the occurrence of an event ineligible under Section 101. The majority used a "preemption analysis" to determine whether "additional substantive limitations . . . narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself." *Id.* at *4 (alteration in original). The *Accenture* majority determined that the claim preempted the abstract idea of "generating tasks [based on] rules . . . to be completed upon the occurrence of an event" and therefore, held that the claim was patent ineligible. *Id.* at *8 (alterations in original). In reaching its conclusion, the majority dissected the claim and ignored certain elements. This contradicts the holding in *Ultramercial*. Again, the *Accenture* majority did not define what it means to be an "abstract idea," or why the non-computer elements of the claims at issue were being deemed as directed to an "abstract idea."

Notably, the Chief Judge dissented in *Accenture*, stating that: "The claims require a specific combination of computer components, including an insurance transaction database, a task library database, a client component, and a server component that includes an event processor, task engine, and task assistant." *Id.* at *11. The Chief Judge criticized the majority for "strip[ping] away" limitations and focusing on the purported abstract idea "at the heart" of the claim. *Id.* at *12.

B. The USPTO Applies Yet Another Patentability Standard to Computer-Implemented Inventions After *CLS Bank v. Alice*.

The USPTO has taken its own approach to the patent eligibility of computer-implemented inventions. For instance, in a recent post-grant review decision from the Patent Trial and Appeal Board (PTAB), *SAP America, Inc. v. Versata Development Group, Inc.*, 107 U.S.P.Q.2d 1097, 1108 (PTAB Jun. 11, 2013), the USPTO declared that "the key question is, therefore, whether the claims do significantly more than simply describe the law of nature or abstract idea." Notably, the claims at issue in *Versata* were not directed to a law of nature, natural phenomenon, or mathematical formula. Nonetheless, the USPTO applied authority from this Court's cases that addressed claims directed to a law of nature, natural phenomenon, or mathematical formula. The USPTO held that

> each of the challenged claims involves the use of an abstract idea: determining a price using organizational and product group hierarchies, which are akin to management organizational charts. The concept of organization hierarchies for products and customers is abstract as it represents a disembodied concept, a basic building block of human ingenuity.

Id. at 1110.

The USPTO then held that the claims merely add insignificant, conventional and routine steps that are implicit in the abstract idea itself. *Id.* at 1111. As such, the USPTO held that the claim was patent ineligible.

III. The Decision Below Casts Doubt on Thousands of Patents, Including the Rapidly Growing Number of Computer-Implemented Inventions.

The confusion created by the conflicting camps at the Federal Circuit presents a significant issue impacting many businesses. The current confusion will have many negative impacts on business, including unpredictability at the USPTO regarding which patents it will not allow based on Section 101, unpredictability in litigation (including litigation involving patents that issued many years ago), unpredictability in new and old licensing transactions and the inability of businesses to efficiently allocate resources to research and development. As noted by Judge Newman in one of the six *CLS Bank v. Alice* opinions:

> Today's irresolution concerning section 101 affects not only this court and the trial courts, but also the PTO examiners and agency tribunals, and all who invent and invest in new technology. The uncertainty of administrative and judicial outcome and the high cost of resolution are a disincentive to both innovators and competitors.

Alice, 717 F.3d at 1321 (Newman, J., dissenting in part).

An ultimate decision on the appropriate test for Section 101 will impact many patents. As noted by Judge Moore in her dissenting-in-part opinion:

> And let's be clear: if all of these claims, including the system claims, are not patent-eligible, this case is the **death of hundreds of thousands of patents, including all business method, financial system, and software patents as well as many computer implemented and telecommunications patents**.
>
> . . . .

> If all of the claims of these four patents are ineligible, so too are the 320,799 patents which were granted from 1998-2011 in the technology area "Electrical Computers, Digital Processing Systems, Information Security, Error/Fault Handling." Every patent in this technology category covers inventions directed to computer software or to hardware that implements software. In 2011 alone, 42,235 patents were granted in this area. This would render ineligible nearly 20% of all the patents that actually issued in 2011. If the reasoning of Judge Lourie's opinion were adopted, it would decimate the electronics and software industries. There are, of course, software, financial system, business method and telecom patents in other technology classes which would also be at risk. So this is quite frankly a low estimate. **There has never been a case which could do more damage to the patent system than this one.**

Alice, 717 F.3d at 1313 & n.1 (Moore, J., dissenting in part) (emphasis added) (citations omitted).[5] *Amici* note that Judge Moore's statement above actually understates the potential impact of the *CLS Bank v. Alice* decision. The art unit cited by Judge Moore handles just a small number of the total number of patents involving software. Furthermore, Judge Moore does not take into account the impact that a definition of "abstract" will have on non-computer-related inventions.

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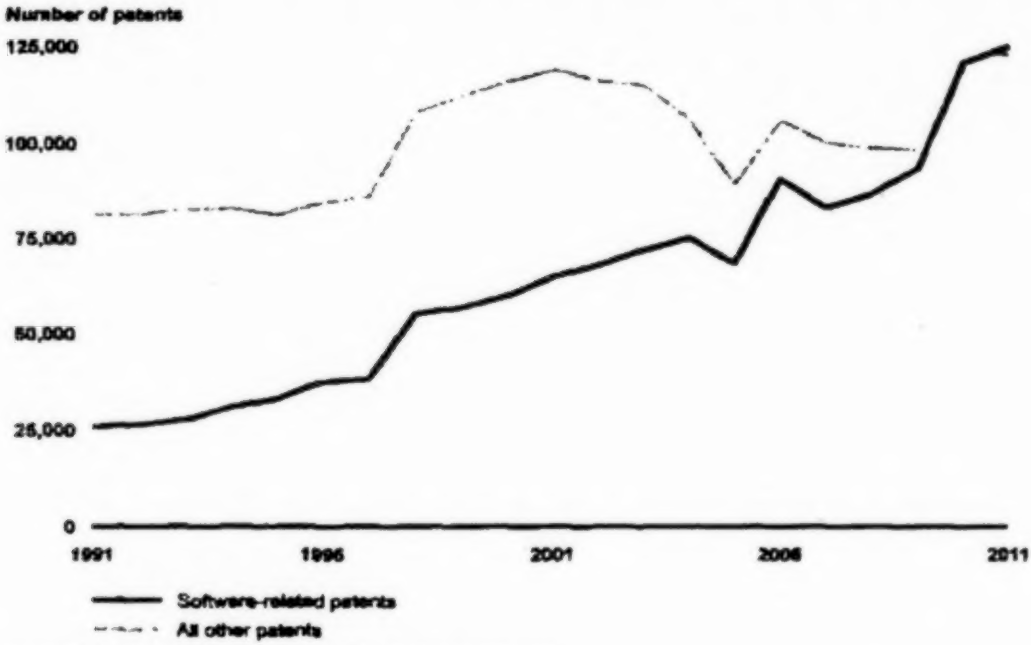
[5] *Amici* express no opinion in the present brief regarding the correctness of Judge Moore's belief that the en banc decision invalidated any patents other than the ones at issue in that particular case.

It is important for all parties, including inventors, companies who own patents, entities accused of infringing patents, investors, the USPTO, and the courts, to have clear guidance on the metes and bounds of patent-eligible subject matter. Under the current state of the law, Section 101 will become a litigated issue in at least every lawsuit involving a patent with a method claim and the outcome of each lawsuit on this issue will be impossible to predict. Without clarity, it is nearly impossible for businesses and individuals to make well-informed decisions on issues that implicate the development or use of computer-implemented inventions. This includes all aspects of patent strategy such as conducting research and development, whether to invest in the underlying technology, whether to file a patent application, whether to continue paying maintenance fees on an issued patent, whether to invest in a company relying on protecting its innovations with patents, and whether to license a company's patent or challenge the patent in the court systems.

Over the past twenty years, the number of computer-implemented inventions in the United States has grown at a significant pace relative to other types of inventions, as reflected in the relative growth of patents claiming computer-implemented inventions. This growth trend was recently highlighted in a report by the United States Government Accountability Office (GAO), which showed that approximately 50% of all granted patents are software-related.[6]

Figure 1: Number of Software-Related Patents Granted per Year by PTO, 1991 to 2011



Source: GAO analysis of United States Patent and Trademark Office data

Note: Software-related patents include a number of patent classes that are most likely to include patents with software-related claims, and this includes business method patents.

Regardless of whether a company supports or opposes defining "abstract" to encompass computer-implemented inventions, how the bounds of 35 U.S.C. § 101 are defined will have a drastic impact on a significant cross-section of U.S. patents. In addition, the confusion created by the Federal Circuit also impacts many more patents than just those claiming computer-implemented inventions. The meaning of "abstract" will impact many patents that do not recite computer elements, such as patents directed to biotechnology and surgical procedures and to methods of playing novel and non-obvious games.

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[6] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-13-465, INTELLECTUAL PROPERTY: ASSESSING FACTORS THAT AFFECT PATENT INFRINGEMENT LITIGATION COULD HELP IMPROVE PATENT QUALITY 12 (2013), *available at* http://www.gao.gov/assets/660/657103.pdf.

IV. *CLS Bank v. Alice* Is the Best Vehicle for this Court To Address the Scope of Patentability Under Section 101.

Amici realize that there is a pending petition for *certiorari* from another Federal Circuit case that addresses the patentability of computer-implemented inventions under Section 101.[7] Furthermore, on or before November 8, 2013, *Amicus* Bancorp plans to file a petition regarding its own patents that addresses similar issues.[8] *Amici* respectfully submit that Alice's Petition presents the best vehicle for resolving these issues.

First, *Ultramercial* and *Bancorp* each were the result of decisions from a single panel of three judges at the Federal Circuit. On the contrary, *CLS Bank v. Alice* was an en banc case that includes the viewpoints of all camps at the Federal Circuit.

Second, *Bancorp* was decided without the benefit of any of the viewpoints expressed in *Alice*, and *Ultramercial* was decided based upon the analysis of only one of the six viewpoints expressed in *Alice* – Judge Lourie's plurality. On the contrary, granting the petition in this case will allow this Court to review the most recent viewpoints of all members of the en banc Federal Circuit.

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[7] *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013), *petition for cert. filed*, 2013 WL 4495981 (U.S. Aug. 23, 2013) (No. 13-255).

[8] *Bancorp Servs., LLC v. Sun Life Assurance Co.*, 687 F.3d 1266 (Fed. Cir. 2012), *appeal docketed*, No. 13A185 (U.S. Aug. 13, 2013). (Application (13A185) granted by the Chief Justice extending the time to file until November 8, 2013.)

Third, *Ultramercial* only addressed the patentability of a computerized method claim, not the patentability of a tangible computer system or computer-readable medium. On the contrary, like Bancorp, Alice has asserted the full range of computer-implemented inventions that cover the three main categories of patent-eligible subject matter – computerized method claims, computer-readable medium claims and system claims requiring computer hardware. Because Alice's Petition raises the patentability of all three forms of computer-implemented inventions, the other petitions raising the same or similar issue, including Bancorp's forthcoming petition, should be held in abeyance for further consideration in light of this Court's decision in the present case. *Lawrence v. Chater*, 516 U.S. 163, 166-67 (1996); *see also WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012) (utilizing "GVR" order in a Section 101 case).

CONCLUSION

Amici urge this Court to grant Alice's Petition to bring clarity to the meaning of "abstract" under Section 101 and to resolve when claims to computer-implemented inventions (that are not directed to a law of nature, natural phenomenon or mathematical formula) are patent-eligible subject matter within the meaning of 35 U.S.C. § 101.

Respectfully submitted,

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October 7, 2013

APPENDIX

LIST OF *AMICI CURIAE*

Amicus Trading Technologies International, Inc. ("TT"), founded in 1994, makes derivatives trading software and execution solutions for professional traders. TT's software is purchased by premier investment banks, brokers, Futures Commission Merchants, hedge funds, proprietary trading firms and other trading institutions and is used each day by thousands of traders to access dozens of electronic exchanges around the world. TT is headquartered in Chicago and employs approximately 450 people worldwide. TT has additional offices in New York, Stamford, Houston, Sao Paulo, London, Geneva, Frankfort, Singapore, Hong Kong, Tokyo, and Sydney. TT invests heavily in research and development and has obtained patents covering various features of its products. TT relies on its patents to protect its investment in research and development. Most of TT's patents are directed to computer-implemented inventions and many of its patents are directed to novel software-implemented tools used by traders to execute and manage orders.

Amicus CME Group Inc. ("CME"), a publicly traded company, is the world's leading and most diverse derivatives marketplace. The company is comprised of five Designated Contract Markets ("DCMs"): CME, CBOT, NYMEX, COMEX, and KCBT. While CME is headquartered in Chicago, its 2800 employees are located across North and South America, Europe, and Asia. The CME invests heavily in R&D and has developed innovative products and technology. The CME relies on patents, including many directed to computer-implemented inventions, to protect its innovations.

Amicus Bancorp Services, LLC ("Bancorp"), founded in 1993, assists large financial institutions and Fortune 500 companies by developing innovative structured financial products to meet the unique needs of its clients. The USPTO has granted Bancorp patents on novel computer systems, media, and processes that administer those complex financial products with automated functionality requiring specially programmed computers. Bancorp has placed and currently services and administers structured financial products, with particular emphasis on specialized computer administration platforms. Bancorp's patented computer administration systems are specifically designed to support daily valuation and other automated functionality for hedge funds, nonqualified deferred compensation plans, and separate account life insurance policies with stable value protection.

Amicus Regulatory DataCorp ("RDC") commenced operations in July 2002, as the only compliance company created by the financial services sector. Based on an exclusive license to over two dozen patents, many of which received accelerated examination in the United States Patent and Trademark Office as inventions to combat terrorism, RDC was formed as an industry-owned venture to develop technologies and systems that deliver sophisticated data-aggregation services to combat global threats posed by money laundering, fraud, corruption, organized crime, suspicious activities, and terrorist financing. Under these patents, RDC has developed processes to help firms identify and determine the risk-relevance of, and resulting actions required for, certain parties attempting to engage in transactions via the international banking and financial system. This patented, risk management technology enables the real-time collection of in-depth, risk-relevant, continually and automatically updated data aggregated from over 15,000 public sources. And since RDC's inception just over a decade ago, these technologies have powered the growth of RDC's "GRID" (Global Regulatory Information Database) from 2 million records, to over 20 million and – growing by approximately 7000 records daily.

Patents (and in particular, patents directed to computer-implemented inventions) are important to RDC because the GRID database and RDC's related processes are predicated on publicly available information. RDC's modeling and detection processes are designed to help prevent suspect transactions from otherwise hiding in plain sight. Without patents, RDC would have been unable to attract investment and continue to develop and implement technologies to stay ahead of the endless creativity of those conducting illicit transactions. Particularly in the highly regulated and technology interconnected worlds of global banking and finance, as cash disappears and digital currency becomes ubiquitous, firms must be permitted to develop – and ultimately patent-protect – their inventions. The very fact of RDC's founding, and indeed its continued operation and attraction of investment, provides a powerful example of the need for a patent system that is flexible enough – and laws that are clear enough – to incentivize and protect emerging technologies in a dynamic and high-stakes environment.

Amicus CoreLogic (NYSE: CLGX) is a publicly traded company headquartered in Irvine, CA, with over 5,000 employees worldwide. CoreLogic is a leading property information, analytics and services provider in the United States and Australia. The company's combined data from public, contributory and proprietary sources includes over 3.3 billion records spanning more than 40 years, providing detailed coverage of property, mortgages and other encumbrances, consumer credit, tenancy, location, hazard risk and related performance information. The markets CoreLogic serves include real estate and mortgage finance, insurance, capital markets, transportation and government. CoreLogic delivers value to clients through unique data, analytics, workflow technology, advisory and managed services. Clients rely on CoreLogic to help identify and manage growth opportunities, improve performance and mitigate risk. CoreLogic relies on patents, amongst other intellectual property, to protect its innovations and investments in R&D and has various U.S. patents and patent applications covering computer-implemented innovations in its products.

Amicus Aristocrat Technologies Australia Pty. Ltd. ("Aristocrat"), is an Australian-based and publically listed company that employs approximately 800 people in the United States and over 2,000 people across the globe. Aristocrat is a leading manufacturer and supplier of gaming equipment to the casino industry and has major operations in the US, Canada, South America, Europe, Asia and Australia. The gaming industry is an extremely competitive industry and one that requires relentless product innovation in order to remain competitive. Because of this, Aristocrat invests significant resources into its R&D activities. With a global patent portfolio exceeding 1000 issued patents and pending applications, Aristocrat's future is dependent on a robust and enforceable patent portfolio that maximizes the commercial return on its R&D investment.

Amicus Casino Gaming, LLC is a Chicago-based company that develops and licenses novel games to casinos, equipment manufacturers and online wagering sites. The company relies on patents to protect its innovations.

Amicus Charles River Analytics Inc. ("Charles River"), which was founded in 1983, applies computational intelligence technologies to develop mission-relevant tools and solutions to transform customers' data into knowledge that drives accurate assessment and robust decision-making. Charles River is headquartered in Boston and employs around 130 people. Charles River continues to grow its technology, customer base, and strategic alliances through research and development programs for the Department of Defense and the Intelligence Community, addressing a broad spectrum of mission areas and functional domains, including: sensor and image processing, situation assessment and decision aiding, human systems integration, and cyber analytics. These efforts have resulted in a series of successful products that support continued growth in its core R&D contracting business, as well as the commercial sector. Charles River became an employee-owned company in 2012, to set the stage for the next generation of innovation, service, and growth. Charles River owns ten patents that protect its innovations.

Amicus Architecture Technology Corporation ("ATCorp") is a high technology small business engaged in research, development, engineering, and services. ATCorp employs approximately 100 people at three different locations in the United States. ATCorp's software-intensive solutions provide government and commercial clients with the flexibility to "customize" new, existing, and legacy systems with features that meet or exceed their next generation requirements. ATCorp has developed innovative software-based products and has distributed them to thousands of users worldwide. ATCorp's Systems Engineering and Software Development groups specialize in specification, development, integration, and evaluation of high-performance, network-centric, safety-critical computing systems for the military and air traffic sectors. Due to the unique design and features of ATCorp software products, more than 15 patents have been granted since 2003. Government and commercial clients rely on ATCorp to provide key software components to next generation network systems providing advanced capabilities and protection against the growing threat of "cyber-attacks."

Amicus Great Lakes NeuroTechnologies Inc. (GLNeuroTech.com) understands that movement disorders, such as Parkinson's disease, represent a complex problem for patients, physicians, and researchers. Great Lakes NeuroTechnologies produces a line of bioinstrumentation products that includes physiological monitors and patient-centered diagnostic and therapy systems integrated with wireless, remote, and web-based applications. By working together with customers, Great Lakes NeuroTechnologies ensures the delivery of high quality products that fit customers' clinical and research requirements. Great Lakes NeuroTechnologies' activities include R&D, engineering, manufacturing, distribution and the export of research systems and medical devices. It sells its products on all seven continents. Its major markets include physiological monitoring for research and education, movement disorders such as Parkinson's disease, telemedicine and in-home health monitoring. Customers include physicians, medical technicians, healthcare practitioners, researchers, universities, and hospitals. Great Lakes NeuroTechnologies has 26 employees, six issued patents with another about to be issued, eighteen U.S. pending applications, and six PCT applications. The company was incorporated in 2010.

Amicus Miramar Labs, Inc. ("Miramar") is owner of the miraDry System, a breakthrough non-invasive technology that utilizes microwave energy to safely eliminate underarm sweat. The miraDry System is the result of over five years of research and development, including a major long-term clinical study conducted by leading dermatologists across the United States. Miramar has over 80 employees and relies on patents to protect its computer controlled products.

Incorporated in 2007, *Amicus* NeuroWave Systems Inc. ("NeuroWave") is an ISO 13485 medical device company, dedicated to developing innovative, state-of-the-art signal processing technologies for the next generation of brain monitors for improved and safer patient care. The NeuroSENSE® Monitor, the latest generation of brain monitors for patient-customized anesthesia and sedation, is now cleared for sale in markets recognizing the CE mark. NeuroWave's advanced brain monitors incorporate intelligent algorithms for the automated assessment of brain function for anesthesia/analgesia/sedation monitoring and seizure detection. New products for 1) real-time control and delivery of anesthetics and analgesics using electroencephalograms ("EEG") and 2) miniature EEG machines to help identify mild traumatic brain injury at the point of injury are being developed under United States Army and National Institutes of Health contracts. NeuroWave currently has eight employees, three patents with another about to be issued, twelve U.S. patents pending, and six PCT applications. Patents provide the bulk of the value of the company.

Amicus Flocel Inc. is a biotechnology company formed in 2004, dedicated to innovation towards helping the research community better conduct and advance *in-vitro* drug studies. In contrast to other available models of blood-brain barriers, Flocel's Dynamic In-Vitro Blood-Brain Barrier ("DIV-BBB") respects the anatomical aspects of the *in situ* endothelial cell-astrocyte interactions and replicates the physiological levels of shear stress to which *in situ* endothelial cells are exposed. The DIV-BBB allows formation of physiological transendothelial resistance, and formation of gap junctions that can be easily visualized by an electron microscope or determined experimentally with the use of tracers. Flocel has one issued patent and three pending patent applications. Even though the technologies are based on cellular testing, they are implemented with computer-based controls and use data processing to implement the results.

Formed in 1990, *Amicus* Cleveland Medical Devices Inc. ("CleveMed") is leading the future in medical services and devices for portable sleep testing. From monitors for home sleep testing to full PSG, CleveMed aims to improve the delivery of care. Its web-based services and devices meet AASM guidelines, are easy for patients to use, streamline operations for healthcare providers, and offer-cost efficient solutions for payers. The company's SleepView product and service lowers the cost for an obstructive sleep apnea test by 75-90%, and the number of tests has been growing at 14% per month for two years. CleveMed has eighteen employees. The company has twelve patents and 23 pending patent applications covering computer hardware and software-based medical devices, data processing, and business methods. A large part of the company's valuation is based on these patents.

Amicus Orbital Research Inc. ("Orbital") was formed in 1990 and has seventeen employees. Orbital develops and commercializes new and innovative custom-engineered solutions using its expertise in Aerodynamic Control Systems, Medical Devices and Micro Electronic Devices for various commercial and military applications. Examples of Orbital's developments include new longer range, higher accuracy, lower cost weapons; chronic ECG electrodes and monitors; oxygen sensors used on high performance aircraft; and low cost, high temperature (250C) electronics. Orbital has 42 issued patents and 36 pending patent applications. Algorithms, software, data processing, and computer hardware play a significant role in company valuation.

Amicus TIP Solutions, Inc. ("TIP") is a Chicago-based start-up software company that builds voice-focused software and firmware applications for smartphones. The company's mission is to change the way the world answers a phone call. TIP has multiple U.S. and international issued and filed patents that claim computer-implemented inventions used in the company's products. TIP relies on its patents to protect its innovations and as an important factor to attract investments in the company.

Amicus MONKEYmedia, Inc. ("MONKEYmedia") is a privately-held user interface design studio based in Austin, Texas. Founded in 1994, MONKEYmedia researches, develops, and sells software that facilitates human-computer interaction. Example technologies range from virtual force-feedback interfaces and telescopic video advertising to multi-channel interactive environments that embody novel cinematic paradigms. MONKEYmedia relies on patents that it has obtained to protect its innovations. MONKEYmedia has also licensed patents to other companies.

Amicus Chief Experience Officer, Inc. ("CXO") is a consulting firm that advises start-ups and Fortune 500 corporate executives in intellectual property strategy and the design and development of hardware & software products. CXO was founded in 2005 and has been responsible for establishing user experience strategies for technologies ranging from medical informatics, financial services, legal research and document management systems to touch screen remote controls, smartphones and other media-rich devices.

Amicus Horizon Digital Finance LLC ("HDF"), through multiple websites (including www.myautoloan.com, www.onehourfinance.com, www.preferred-dealer.net, and www.mymotorcycleloan.com), is a Texas-based company that provides a direct-to-consumer, internet-based marketplace that helps consumers take control of the research, finance, and buy processes for automobiles, motorcycles, boats, recreational vehicles, home equity, and mortgages. HDF has been in business since 2003. HDF provides consumers with a secure, confidential process to obtain loan offers and provides a wide range of products and services to simplify the search for information and funding alternatives. HDF facilitates the matching of lenders based upon customer needs through a proprietary analysis and evaluation. These computer implemented technologies and processes are protected by several U.S. patents (and pending applications) that are critical to the success and viability of HDF.

Amicus Extraordinary Re Holdings, Inc. ("XRe") is a start-up U.S. company that is creating technology to enable the liquid trading of insurance liabilities. XRe has two U.S. patents that protect the innovative methods used in its technology. Securing these patents has consumed a large part of the cost of starting the company. The patents have also been important in helping XRe raise capital. It is in XRe's interest, as with other start-ups, that the law be clear with respect to what types of inventions are eligible for patentability.

Amicus DDB Technologies LLC ("DDB") is an Austin, Texas-based company that was formed in the late 1990's. DDB (and its predecessor Instant Sports, Inc.) is a pioneer in the design and development of, among other things, technology that enables the broadcasting of live sporting events to a viewer's computer to enable the viewer to watch a computer simulation of that sporting event. This computer-implemented technology was adopted by virtually every sports broadcasting company and sports league. DDB relies on numerous U.S. patents to protect its technology and to attract investments, and would not be in existence without these patents.

Amicus RedTxt.com.au Pty. Ltd. ("RedTxt") makes and sells SMS/TXT solutions for large and small communities. RedTxt's SMS/TXT solutions include, for example, publishing sporting event scores and advertising via SMS, an automated platform for sending Twitter messages to SMS, and a web-based platform that allows users to see in real-time the status of an SMS message. RedTxt has granted and pending U.S. Patents in the field of mobile applications that involve software and computers. Uncertainty in the law relating to patentability affects RedTxt's business strategies and therefore, shareholder value.

JOINT APPENDIX

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

JAN 21 2014

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

JOINT APPENDIX: VOLUME I OF III

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PETITION FOR CERTIORARI FILED SEPTEMBER 4, 2013
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NOTICE

The following documents have been omitted from the printing of this Joint Appendix. They may be found in the Petitioner's Appendix to the 13-298 Petition For A Writ Of Certiorari at the following pages:

CLS Bank Int'l v. *Alice Corp.*, 717 F.3d 1269 (Fed. Cir. 2013) 1a

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UNITED STATES COURT
DISTRICT OF COLUMBIA

CIVI DOCKET FOR CASE#: 1:07-cv-00974-RMC

CLS BANK INTERNATIONAL,

v.

ALICE CORPORATION PTY. LTD.

RELEVANT DOCKET ENTRIES

DATE FILED	#	DOCKET TEXT
05/27/2007	1	COMPLAINT against ALICE CORPORATION PTY. LTD. (Filing fee $ 350, receipt number 4616004510) filed by CLS BANK INTERNATIONAL. (Attachments: # 1 Civil Cover Sheet)(tg,) (Entered: 05/25/2007)
05/24/2007	2	LCvR 7.1 CERTIFICATE OF DISCLOSURE of Corporate Affiliations and Financial Interests by CLS BANK INTERNATIONAL (tg,) (Entered: 05/25/2007)
05/24/2007		SUMMONS Not Issued as to ALICE CORPORATION PTY. LTD. (tg,) (Entered: 05/25/2007)

DATE FILED	#	DOCKET TEXT
06/18/2007		Summons Issued (1) as to ALICE CORPORATION PTY. LTD.. (mmh,) (Entered: 06/18/2007)
06/25/2007	3	RETURN OF SERVICE/ AFFIDAVIT of Summons and Complaint Executed. ALICE CORPORATION PTY. LTD. served on 6/18/2007, answer due 7/9/2007 (Bickart, David) (Entered: 06/25/2007)
06/25/2007	4	STIPULATION by CLS BANK INTERNATIONAL. (Bickart, David) (Entered: 06/25/2007)
06/26/2007	5	ERRATA by CLS BANK INTERNATIONAL 3 Summons Returned Executed. (Bickart, David) (Entered: 06/26/2007)
08/16/2007	6	ANSWER to Complaint and, COUNTERCLAIM against CLS BANK INTERNATIONAL and CLS SERVICES LTD., by ALICE CORPORATION PTY. LTD.. Related document: 1 Complaint filed by CLS BANK INTERNATIONAL. (Attachments: # 1 Exhibit A# 2 Exhibit B# 3 Exhibit C)(Carlson, Michael) Modified on 8/16/2007 (tg,). (Entered: 08/16/2007)

DATE FILED	#	DOCKET TEXT
08/16/2007	7	MOTION to Dismiss COUNT III by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Text of Proposed Order) (Carlson, Michael) (Entered: 08/16/2007)
08/16/2007	8	LCvR 7.1 CERTIFICATE OF DISCLOSURE of Corporate Affiliations and Financial Interests by ALICE CORPORATION PTY. LTD. (Carlson, Michael) (Entered: 08/16/2007)
08/28/2007	9	STIPULATION by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Bickart, David) (Entered: 08/28/2007)
08/30/2007		MINUTE ENTRY ORDER. The Court treats 9 the Stipulation filed by the parties as a motion for extension of time. The Court denies the motion, however, for failure to demonstrate cause. See Fed. R. Civ. P. 6(b). Signed by Judge Rosemary M. Collyer on 8/30/2007. (lcrmc2) (Entered: 08/30/2007)
08/31/2007	10	Unopposed MOTION for Extension of Time to Respond by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Text of Proposed Order) (Bickart, David) (Entered: 08/31/2007)

DATE FILED	#	DOCKET TEXT
09/04/2007		MINUTE ENTRY ORDER granting 10 Plaintiff's Motion for Extension of Time. Plaintiff CLS Bank International and Counterclaim-Defendant CLS Services Ltd., shall file their responses to Alice Corp.'s counterclaims no later than September 12, 2007; Plaintiff CLS Bank shall file its opposition to Alice Corp.'s motion to dismiss no later than September 12, 2007. Signed by Judge Rosemary M. Collyer on 9/4/2007. (lcrmc2) (Entered: 09/04/2007)
09/04/2007		Set Deadlines/Hearings: Response to Counterclaim due by 9/12/2007. Response to Motion to Dismiss due by 9/12/2007. (cdw) (Entered: 09/06/2007)
09/12/2007	11	MOTION to Dismiss Counterclaims, or Alternatively, MOTION for Summary Judgment by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Text of Proposed Order Proposed Order Dismissing Counterclaims of Defendant and Counterclaim-Plaintiff Alice Corporation Pty. Ltd.)(Bickart, David) (Entered: 09/12/2007)

DATE FILED	#	DOCKET TEXT
09/12/2007	12	Memorandum in opposition to re 7 MOTION to Dismiss COUNT III of the Complaint filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Attachments: # 1 Text of Proposed Order Proposed Order Denying Defendant Alice Corporation Pty. Ltd.'s Motion to Dismiss Count III of the Complaint)(Bickart, David) (Entered: 09/12/2007)
09/19/2007	13	Consent MOTION for Extension of Time to File Memorandum in Opposition by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Text of Proposed Order) (Carlson, Michael) (Entered: 09/19/2007)
09/24/2007		MINUTE ENTRY ORDER granting 13 Alice Corp.'s Motion for Extension of Time. Alice Corp. shall file its opposition to CLS Bank's motion to dismiss its counterclaims no later than October 4, 2007. Signed by Judge Rosemary M. Collyer on 9/24/2007. (lcrmc2) (Entered: 09/24/2007)
09/24/2007	14	REPLY to opposition to motion re 7 MOTION to Dismiss COUNT III filed by ALICE CORPORATION PTY. LTD..

DATE FILED	#	DOCKET TEXT
		(Carlson, Michael) (Entered: 09/24/2007)
09/24/2007		Set Deadlines/Hearings: Response to Motion to Dismiss due by 10/4/2007. (cdw) (Entered: 09/26/2007)
10/02/2007	15	MOTION for Leave to Appear Pro Hac Vice: Attorney Name- William A. Tanenbaum, Steven J. Glassman, Stephen J. Elliott, and Seth Simpson, :Firm- Kaye Scholer LLP, :Address- 425 Park Avenue, New York, NY 10022. Phone No. - (212) 836-8000. Fax No. - (212) 836-8689 by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Text of Proposed Order) (Bickart, David) (Entered: 10/02/2007)
10/04/2007	16	Memorandum in opposition to re 11 MOTION to Dismiss Counterclaims, or Alternatively MOTION for Summary Judgment filed by ALICE CORPORATION PTY. LTD.. (Attachments: # 1 Affidavit Rule 56(f) Affidavit in Support of Alice Corporation Pty. Ltd.'s Opposition to the Motion to Dismiss the Counterclaims or, Alternatively, for Summary Judgment# 2 Exhibit 1 to

DATE FILED	#	DOCKET TEXT
		Affidavit# 3 Exhibit 2 to Affidavit# 4 Exhibit 3 to Affidavit# 5 Exhibit 4 to Affidavit# 6 Exhibit 5 to Affidavit# 7 Exhibit 6 to Affidavit# 8 Exhibit 7 to Affidavit# 9 Exhibit 8 to Affidavit# 10 Exhibit 9 to Affidavit# 11 Exhibit 10 to Affidavit# 12 Exhibit 11 to Affidavit# 13 Exhibit 12 to Affidavit# 14 Text of Proposed Order)(Carlson, Michael) (Entered: 10/04/2007)
10/05/2007		MINUTE ENTRY ORDER granting 15 Motion for Leave to Appear Pro Hac Vice by William A. Tanenbaum, Steven J. Glassman, Stephen J. Elliott, and Seth Simpson. Signed by Judge Rosemary M. Collyer on 10/5/2007. (lcrmc2) (Entered: 10/05/2007)
10/09/2007	17	MEET AND CONFER STATEMENT. (Bickart, David) (Entered: 10/09/2007)
10/15/2007	18	REPLY to opposition to motion re 11 MOTION to Dismiss Counterclaims, or Alternatively MOTION for Summary Judgment filed by CLS BANK INTERNATIONAL, CLS SER-

DATE FILED	#	DOCKET TEXT
		VICES LTD.. (Bickart, David) (Entered: 10/15/2007)
01/03/2008	19	ORDER denying 7 Defendant Alice Corporation Pty. Ltd.'s Motion to Dismiss Count III and denying 11 Plaintiff CLS Bank International's Motion to Dismiss Counterclaims or, Alternatively, for Summary Judgment. See attached Order for further details. Signed by Judge Rosemary M. Collyer on 1/3/08. (lcrmc2) (Entered: 01/03/2008)
01/07/2008	20	ORDER FOR INITIAL SCHEDULING CONFERENCE. An Initial Scheduling Conference is set for February 21, 2008 at 12:15 p.m. See attached Order for further details. Signed by Judge Rosemary M. Collyer on 1/7/08. (lcrmc2) (Entered: 01/07/2008)
01/07/2008		Set Deadlines/Hearings: Initial Scheduling Conference set for 2/21/2008 12:15 PM in Courtroom 2, main building, 2nd floor, before Judge Rosemary M. Collyer. (cdw) (Entered: 01/08/2008)
01/16/2008	21	REPLY re 6 Answer to Complaint,, Counterclaim, filed

DATE FILED	#	DOCKET TEXT
		by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Bickart, David) (Entered: 01/16/2008)
01/16/2008	22	Count III ANSWER to 1 Complaint by ALICE CORPORATION PTY. LTD.. Related document: 1 Complaint filed by CLS BANK INTERNATIONAL. (Carlson, Michael) (Entered: 01/16/2008)
02/14/2008	23	MEET AND CONFER STATEMENT. (Bickart, David) (Entered: 02/14/2008)
02/21/2008	24	SCHEDULING ORDER. Initial discovery shall be completed no later than August 22, 2008. A status conference is scheduled for 10:15 a.m. on September 5, 2008. See attached Order for further details. Signed by Judge Rosemary M. Collyer on 2/21/08. (lcrmc2) (Entered: 02/21/2008)
02/21/2008		Set/Reset Deadlines/Hearings: Discovery closes 8/22/2008. Status Conference set for 9/5/2008 10:15 AM in Courtroom 2 before Judge Rosemary M. Collyer. (cdw) (Entered: 02/27/2008)

DATE FILED	#	DOCKET TEXT
02/21/2008		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Initial Scheduling Conference held on 2/21/2008. (Court Reporter: Crystal Pilgrim) (cdw) (Entered: 02/28/2008)
04/23/2008		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Telephone Conference held on 4/23/2008. (cdw) (Entered: 04/23/2008)
04/23/2008		MINUTE ENTRY ORDER amending the Scheduling Order. Pursuant to the teleconference held on April 23, 2008, the parties shall complete initial discovery no later than October 31, 2008. The status conference set for September 5, 2008 is hereby VACATED and will be rescheduled by the Deputy Clerk of this Court. Signed by Judge Rosemary M. Collyer on 4/23/08. (lcrmc2) (Entered: 04/23/2008)
04/23/2008		Set/Reset Deadlines/Hearings: Discovery closes 10/31/2008. (cdw) (Entered: 04/24/2008)
05/07/2008		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Telephone Conference

DATE FILED	#	DOCKET TEXT
		held on 5/7/2008. (Court Reporter: ProTypists) (cdw) (Entered: 05/07/2008)
05/13/2008	25	TRANSCRIPT of Proceedings held on February 21, 2008 Scheduling Conference before Judge Rosemary M. Collyer. Court Reporter: Crystal M. Pilgrim. The public may view the document in the Clerk's Office between the hours of 9:00 a.m. and 4:00 p.m, Monday through Friday. (tg,) (Entered: 05/13/2008)
05/16/2008		NOTICE of Hearing: A Post-Discovery Status Conference is set for 11/7/2008 at 10:15 AM in Courtroom 2 before Judge Rosemary M. Collyer. (cdw) (Entered: 05/16/2008)
05/19/2008	26	NOTICE of Appearance by Ryan T. Scarborough on behalf of ALICE CORPORATION PTY. LTD. (Scarborough, Ryan) (Entered: 05/19/2008)
05/19/2008	27	MEMORANDUM by ALICE CORPORATION PTY. LTD.. (Carlson, Michael) (Entered: 05/19/2008)
05/19/2008	28	MEMORANDUM by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Bickart, David) (Entered: 05/19/2008)

DATE FILED	#	DOCKET TEXT
05/21/2008	29	AFFIDAVIT of David M. Krasnostein submitted by ALICE CORPORATION PTY. LTD.. (Attachments: # 1 Exhibit A)(Carlson, Michael) (Entered: 05/21/2008)
05/22/2008		MINUTE ENTRY ORDER. Pursuant to the telephone conference held on May 22, 2008, CLS Bank International shall file a response of no more than 5 pages to 27 Alice Corporation Pty Ltd.'s Memorandum no later than May 28, 2008. A hearing is set for June 9, 2008 at 3:00 p.m. Signed by Judge Rosemary M. Collyer on 5/22/08. (lcrmc2) (Entered: 05/22/2008)
05/22/2008	30	Joint MOTION for Protective Order by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Exhibit A)(Carlson, Michael) (Entered: 05/22/2008)
05/22/2008	31	NOTICE of Appearance by Stanley Edward Fisher on behalf of ALICE CORPORATION PTY. LTD. (Fisher, Stanley) (Entered: 05/22/2008)
05/22/2008	32	TRANSCRIPT OF PROCEEDINGS before Judge Rosemary M. Collyer of Discovery

DATE FILED	#	DOCKET TEXT
		Conference proceedings held on May 7, 2008; For the first 90 days after this filing date, the transcript may be viewed at the courthouse at a public terminal or purchased from the court reporter referenced above. After 90 days, the transcript may be accessed via PACER. Other transcript formats, (multi-page, condensed, CD or ASCII) may be purchased from the court reporter, Pro-Typists, Inc., 1012 14th Street, NW., Suite 307, Washington, DC 20005. Telephone Number: 202-347-5395. NOTICE RE REDACTION OF TRANSCRIPTS: The parties have twenty-one days to file with the court and the court reporter any request to redact personal identifiers from this transcript. If no such requests are filed, the transcript will be made available to the public via PACER without redaction after 90 days. The policy, which includes the five personal identifiers specifically covered, is located on our website at ww.dcd.uscourts.gov.(tg,) (Entered: 05/23/2008)

DATE FILED	#	DOCKET TEXT
05/22/2008		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Telephone Conference held on 5/22/2008. (cdw) (Entered: 05/23/2008)
05/22/2008		Set/Reset Deadlines/Hearings: Plaintiff's response to 27 due by 5/28/2008. Hearing set for 6/9/2008 03:00 PM in Courtroom 2 before Judge Rosemary M. Collyer. (cdw) (Entered: 05/23/2008)
05/27/2008	33	PROTECTIVE ORDER signed by Judge Rosemary M. Collyer on May 23, 2008. (Attachments: # 1 Exhibit)(cdw) (Entered: 05/27/2008)
05/28/2008	34	RESPONSE re 27 Memorandum filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Bickart, David) (Entered: 05/28/2008)
06/09/2008		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Status Conference held on 6/9/2008. (Court Reporter: Crystal Pilgrim) (cdw) (Entered: 06/10/2008)
08/19/2008		MINUTE ENTRY ORDER. Pursuant to the telephone conference held on August 19, 2008, with Magistrate Judge

DATE FILED	#	DOCKET TEXT
		John M. Facciola presiding, Defendant Alice Corporation Pty. Ltd. shall serve an amended notice of deposition on Plaintiff CLS Bank International no later than the close of business on August 20, 2008. The parties shall inform the Court no later than August 21, 2008 whether a further telephone conference will be necessary to resolve outstanding discovery issues. Signed by Judge Rosemary M. Collyer on 8/19/08. (lcrmc2) (Entered: 08/19/2008)
08/19/2008		Minute Entry for proceedings held before Magistrate Judge John M. Facciola: Telephone Conference held on 8/19/2008. (cdw) (Entered: 08/20/2008)
08/21/2008		MINUTE ORDER referring case to Magistrate Judge Facciola for the purpose of handling the August 19, 2008 telephone conference only. Signed by Judge Rosemary M. Collyer on 8/19/08. (KD) (Entered: 08/21/2008)
08/21/2008	35	CASE REFERRED to Magistrate Judge John M. Facciola for the purpose of handling the August 19, 2008 telephone

DATE FILED	#	DOCKET TEXT
		conference only. (kb) (Entered: 08/26/2008)
08/27/2008	36	MOTION for Discovery to Provide Highly Confidential Information to Alice's Expert Witness, Kathleen Tyson-Quah, Pursuant to Paragraph 20 of the Protective Order by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C) (Scarborough, Ryan) (Entered: 08/27/2008)
08/28/2008		MINUTE ENTRY ORDER. Pursuant to the agreement of the parties, Alice Corporation Pty. Ltd. shall file a brief no later than August 27, 2008, regarding the pending dispute related to the terms of the May 27, 2008 Protective Order. CLS Bank International shall file its response no later than 1:00 p.m. on September 3, 2008. Each filing shall be five pages or less. A telephone conference is set for 9:30 a.m. on September 4, 2008. Signed by Judge Rosemary M. Collyer on 8/28/08. (lcrmc2) (Entered: 08/28/2008)
08/29/2008		Set/Reset Deadlines/Hearings: Reply Brief due by 8/27/2008. Response due by 9/3/2008.

DATE FILED	#	DOCKET TEXT
		Telephone Conference set for 9/4/2008 9:30 AM before Judge Rosemary M. Collyer. (cdw) (Entered: 09/02/2008)
09/02/2008	37	ORDER re referral to Judge Facciola for discovery. Signed by Magistrate Judge John M. Facciola on 9/2/08. (SP,) (Entered: 09/02/2008)
09/03/2008	38	Memorandum in opposition to re 36 MOTION for Discovery to Provide Highly Confidential Information to Alice's Expert Witness, Kathleen Tyson-Quah, Pursuant to Paragraph 20 of the Protective Order filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C)(Bickart, David) (Entered: 09/03/2008)
09/04/2008		MINUTE ENTRY ORDER. For the reasons discussed during the telephone conference held on September 4, 2008, Alice Corporation Pty. Ltd.'s Motion to Provide Highly Confidential Information to Alice's Expert Witness, Kathleen Tyson-Quah, Pursuant to Paragraph 20 of the Protective Order 36 is denied. Signed by Judge Rosemary M.

DATE FILED	#	DOCKET TEXT
		Collyer on 9/4/08. (lcrmc2) (Entered: 09/04/2008)
09/04/2008		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Telephone Conference held on 9/4/2008. (cdw) (Entered: 09/05/2008)
09/19/2008	39	NOTICE of Appearance by David Milton Krinsky on behalf of ALICE CORPORATION PTY. LTD. (Krinsky, David) (Entered: 09/19/2008)
10/27/2008	40	Unopposed MOTION for Extension of Time to Complete Discovery to Conduct Third-Party Depositions by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Text of Proposed Order)(Krinsky, David) (Entered: 10/27/2008)
10/28/2008		MINUTE ORDER granting 40 Defendant/ Counterclaimant's Motion for Extension of Time. The discovery deadline is extended to November 14, 2008, for the limited purpose of conducting Rule 30(b)(6) depositions of IBM Corporation and the Bank of New York Mel on Corporation. Signed by Judge Rosemary M. Collyer on 10/28/08. (lcrmc2) (Entered: 10/28/2008)

DATE FILED	#	DOCKET TEXT
10/28/2008		Set/Reset Deadlines/Hearings: Discovery closes 11/14/2008. (cdw) (Entered: 10/28/2008)
11/07/2008		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Status Conference held on 11/7/2008 setting forth deadlines in this matter. A scheduling order will be issued by the Court. (Court Reporter: Crystal Pilgrim) (cdw) (Entered: 11/07/2008)
11/07/2008		SCHEDULING ORDER. Pursuant to the Status Conference held in open Court on November 7, 2008, Defendant/ Counterclaimant's designation of experts and reports shall be made no later than December 12, 2008; Plaintiff/ Counterdefendant's designation of experts and reports shall be made no later than January 16, 2009; expert depositions shall be completed no later than January 30, 2009; Plaintiff/ Counterdefendant's motion for summary judgment shall be filed no later than February 20, 2009; Defendant /Counterclaimant's opposition and cross motion for summary judgment shall be filed no later than March 20, 2009; Plaintiff /

DATE FILED	#	DOCKET TEXT
		Counterdefendant's opposition and reply shall be filed no later than April 10, 2009; Defendant/Counterclaimant's reply shall be filed no later than April 30, 2009. Oral argument on the motions for summary judgment is scheduled for June 19, 2009 at 10 a.m. Signed by Judge Rosemary M. Collyer on 11/7/08. (lcrmc2) (Entered: 11/07/2008)
11/07/2008		Set/Reset Deadlines/Hearings: Cross Motions due by 3/20/2009. Response to Cross Motion due by 4/10/2009. Reply to Cross Motion due by 4/30/2009. Dispositive Motion due by 2/20/2009. Response to Dispositive Motion due by 3/20/2009. Reply to Dispositive Motion due by 4/10/2009. Motion Hearing set for 6/19/2009 10:00 AM in Courtroom 2 before Judge Rosemary M. Collyer. (cdw) (Entered: 11/08/2008)
02/02/2009	41	Joint MOTION for Extension of Time to File Summary Judgment Motion(s) by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Text of Proposed Order) (Krinsky, David) (Entered: 02/02/2009)

DATE FILED	#	DOCKET TEXT
02/02/2009		MINUTE ORDER granting 41 Joint Motion for Extension of Time. Plaintiff/ Counter-defendant's motion for summary judgment shall be filed no later than March 6, 2009; Defendant/ Counterclaimant's opposition and cross motion for summary judgment shall be filed no later than April 3, 2009; Plaintiff /Counterdefendant's opposition and reply shall be filed no later than April 24, 2009; Defendant/ Counterclaimant's reply shall be filed no later than May 14, 2009. Signed by Judge Rosemary M. Collyer on 2/2/09. (lcrmc2) (Entered: 02/02/2009)
03/06/2009	42	MOTION for Summary Judgment by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Memorandum in Support Motion for Summary Judgement of No Infringement, # 2 Statement of Facts In Support of Motion for Summary Judgement of No Infringement, # 3 Text of Proposed Order for Motion for Summary Judgement) (Bickart, David) Modified on 6/18/2009 UNREDACTED version of the Motion for Summary Judgment with exhibits FILED UNDER SEAL pursuant to

DATE FILED	#	DOCKET TEXT
		Minute Order entered 3/10/2009 (ztr). (Entered: 03/06/2009)
03/06/2009	43	MOTION for Summary Judgment *That Claims of Alice's Patents are Invalid* by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Memorandum in Support Motion for Summary Judgement, # 2 Statement of Facts In Support of Motion for Summary Judgement, # 3 Text of Proposed Order for Summary Judgement) (Bickart, David) . (Entered: 03/06/2009)
03/06/2009	44	AFFIDAVIT *of Abigail Langsam in Support of Motions for Summary Judgement* 42 , 43 by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Attachments: # 1 Exhibit 1, Part 1, # 2 Exhibit 1, Part 2, # 3 Exhibit 1, Part 3, # 4 Exhibit 1, Part 4, # 5 Exhibit 1, Part 5, # 6 Exhibit 1, Part 6, # 7 Exhibit 1, Part 7, # 8 Exhibit 1, Part 8, # 9 Exhibit 1, Part 9, # 10 Exhibit 2, Part 1, # 11 Exhibit 2, Part 2, # 12 Exhibit 2, Part 3, # 13 Exhibit 2, Part 4, # 14 Exhibit 2, Part 5, # 15 Exhibit 2, Part 6, # 16 Exhibit 2, Part 7, # 17 Exhibit 2, Part 8, # 18 Exhibit 2, Part 9,

DATE FILED	#	DOCKET TEXT
		# 19 Exhibit 2, Part 10, # 20 Exhibit 2, Part 11, # 21 Exhibit 2, Part 12, # 22 Exhibit 3, Part 1, # 23 Exhibit 3, Part 2, # 24 Exhibit 3, Part 3, # 25 Exhibit 3, Part 4, # 26 Exhibit 3, Part 5, # 27 Exhibit 3, Part 6, # 28 Exhibit 3, Part 7, # 29 Exhibit 4, # 30 Exhibit 5, # 31 Exhibit 6, # 32 Exhibit 7, # 33 Exhibit 8, # 34 Exhibit 9, # 35 Exhibit 10, # 36 Exhibit 11, # 37 Exhibit 12, # 38 Exhibit 13, # 39 Exhibit 14, # 40 Exhibit 15, # 41 Exhibit 16, # 42 Exhibit 17, # 43 Exhibit 18, # 44 Exhibit 19, # 45 Exhibit 20, # 46 Exhibit 21, # 47 Exhibit 22, # 48 Exhibit 23, # 49 Exhibit 24, # 50 Exhibit 25, # 51 Exhibit 26, # 52 Exhibit 27, # 53 Exhibit 28, # 54 Exhibit 29, # 55 Exhibit 30, # 56 Exhibit 31, # 57 Exhibit 32, # 58 Exhibit 33)(Bickart, David) Modified on 3/9/2009 (rdj,). (Entered: 03/07/2009)
03/09/2009	45	MOTION for Order *To File Documents Containing Protected Information Under Seal* by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Bickart, David) (Entered: 03/09/2009)

DATE FILED	#	DOCKET TEXT
03/10/2009		NOTICE OF ERROR re 45 Motion for Order; emailed to dbickart@kayescholer.com, cc'd 7 associated attorneys -- The PDF file you docketed contained errors: 1. Counsel needs to file propsed order to document 45 (ks,) (Entered: 03/10/2009)
03/10/2009	46	NOTICE of Proposed Order *to File Documents Containing Protected Information Under Seal* by CLS BANK INTERNATIONAL, CLS SERVICES LTD. re 45 MOTION for Order To File Documents Containing Protected Information Under Seal (Bickart, David) (Entered: 03/10/2009)
03/10/2009		MINUTE ORDER granting 45 Plaintiff/Counterclaim Defendant and Counterclaim Defendants' Motion to File Documents Containing Protected Information Under Seal Pursuant to the Protective Order. Signed by Judge Rosemary M. Collyer on 3/10/09. (lcrmc2) (Entered: 03/10/2009)
04/03/2009	47	MOTION for Leave to File *under Seal* by ALICE CORPORATION PTY. LTD. (Carlson, Michael) (Entered: 04/03/2009)

DATE FILED	#	DOCKET TEXT
04/03/2009	48	ENTERED IN ERROR..... NOTICE *of FIling Documents Under Seal* by ALICE CORPORATION PTY. LTD. re 47 MOTION for Leave to File *under Seal* (Carlson, Michael) Modified on 4/3/2009 (tr). (Entered: 04/03/2009)
04/03/2009	49	NOTICE *of FIling DOcuments Under Seal* by ALICE CORPORATION PTY. LTD. re 47 MOTION for Leave to File *under Seal* (Carlson, Michael) (Entered: 04/03/2009)
04/03/2009		NOTICE OF CORRECTED DOCKET ENTRY: re 48 Notice (Other) was entered in error and counsel has refiled said pleadings as Docket Entry 49 . Please disregard Docket Entry 48 . (tr) (Entered: 04/03/2009)
04/03/2009	50	ERRATA *Corrected Page 2* by ALICE CORPORATION PTY. LTD. 47 MOTION for Leave to File *under Seal* filed by ALICE CORPORATION PTY. LTD.. (Carlson, Michael) (Entered: 04/03/2009)
04/03/2009	51	MOTION for Partial Summary Judgment *as to Extraterritoriality* by ALICE CORPORATION PTY. LTD. (Attachments: # 1

DATE FILED	#	DOCKET TEXT
		Exhibit 1, # 2 Exhibit 2-5, # 3 Exhibit 6, # 4 Exhibit 7-18, # 5 Exhibit 19, # 6 Exhibit 20-38, # 7 Exhibit 39, # 8 Exhibit 40-43, # 9 Exhibit 44, # 10 Exhibit 45-53, # 11 Exhibit 54, # 12 Exhibit 55-57, # 13 Exhibit 58, # 14 Exhibit 59, # 15 Exhibit 60, # 16 Exhibit 61, # 17 Exhibit 62, # 18 Exhibit 63, # 19 Exhibit 64, # 20 Exhibit 65-80, # 21 Exhibit 81, # 22 Exhibit 82, # 23 Exhibit 83, # 24 Exhibit 84-100, # 25 Exhibit 101, # 26 Exhibit 102-104, # 27 Exhibit 105, # 28 Exhibit 106, # 29 Exhibit 107, # 30 Exhibit 108, # 31 Exhibit 109, # 32 Exhibit 110, # 33 Exhibit 111, # 34 Exhibit 112)(Carlson, Michael) (Entered: 04/03/2009)
04/03/2009		MINUTE ORDER granting 47 Defendant's Motion for Leave to File Under Seal. Signed by Judge Rosemary M. Collyer on 4/3/09. (lcrmc2) (Entered: 04/03/2009)
04/03/2009	52	Memorandum in opposition to re 42 MOTION for Summary Judgment *of no Infringement* filed by ALICE CORPORATION PTY. LTD.. (Carlson, Michael) (Entered: 04/03/2009)

DATE FILED	#	DOCKET TEXT
04/03/2009	53	Memorandum in opposition to re 43 MOTION for Summary Judgment *That Claims of Alice's Patents are Invalid* filed by ALICE CORPORATION PTY. LTD.. (Attachments: # 1 Text of Proposed Order, # 2 Certificate of Service, # 3 Declaration of David M. Krinsky, # 4 Exhibit, # 5 Exhibit, # 6 Exhibit)(Krinsky, David) (Entered: 04/03/2009)
04/03/2009	54	Cross MOTION for Partial Summary Judgment *as to Subject Matter Eligibility* by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Text of Proposed Order, # 2 Certificate of Service, # 3 Declaration of David M. Krinsky, # 4 Exhibit, # 5 Exhibit, # 6 Exhibit)(Krinsky, David) (Entered: 04/03/2009)
04/03/2009	55	Memorandum in Support of re 51 MOTION for Partial Summary Judgment as to Extraterritoriality by ALICE CORPORATION PTY. LTD. and 52 Memorandum in opposition to re 42 MOTION for Summary Judgment of no Infringement filed by ALICE CORPORATION PTY. LTD.. (FILED UNDER SEAL) (rdj) Modified on 4/6/2009 (rdj). (Entered: 04/06/2009)

DATE FILED	#	DOCKET TEXT
04/20/2009	56	MOTION for Leave to File *Under Seal Exhibit A to Unopposed Motion for Leave to File Corrected Brief* by ALICE CORPORATION PTY. LTD. (Krinsky, David) (Entered: 04/20/2009)
04/20/2009	57	Unopposed MOTION for Leave to File *Corrected Memorandum in Support of Opposition to CLS's Motion for Summary Judgment of No Infringement and Cross-Motion for Partial Summary Judgment as to Extraterritoriality* by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Exhibit Notice of Filing Proposed Corrected Brief Under Seal)(Krinsky, David) (Entered: 04/20/2009)
04/20/2009		MINUTE ORDER granting 56 and 57 Defendant's Motions for Leave to File Corrected Opposition Under Seal. Signed by Judge Rosemary M. Collyer on 4/20/09. (lcrmc2) (Entered: 04/20/2009)
04/20/2009	58	Unopposed MOTION for Extension of Time to *Summary Judgment Briefing Schedule*, by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Proposed Order)

DATE FILED	#	DOCKET TEXT
		(Glassman, Steven) (Entered: 04/20/2009)
04/20/2009	59	Corrected Memorandum in Support of re 52 Memorandum in opposition and 51 MOTION for Partial Summary Judgment as to Extraterritoriality filed by ALICE CORPORATION PTY. LTD.and Exhibit A to Unopposed Motion for Leave to File Corrected Brief (FILED UNDER SEAL) (rdj) Modified on 4/21/2009 to correct linkage (rdj). (Entered: 04/21/2009)
04/21/2009		MINUTE ORDER granting 58 Plaintiff's Unopposed Motion for Extension of Time. CLS's opposition and reply shall be filed no later than April 28, 2009; Alice's reply shall be filed no later than May 19, 2009. Signed by Judge Rosemary M. Collyer on 4/21/09. (lcrmc2) (Entered: 04/21/2009)
04/21/2009		Set/Reset Deadlines: Plaintiff's Responses & Reply due by 4/28/2009. Defendant's Reply due by 5/19/2009. (cdw) (Entered: 04/22/2009)
04/28/2009	60	MOTION for Order *to File Documents Under Seal* by CLS BANK INTERNATIONAL, CLS

DATE FILED	#	DOCKET TEXT
		SERVICES LTD. (Attachments: # 1 Text of Proposed Order Proposed Order)(Bickart, David) (Entered: 04/28/2009)
04/28/2009	61	NOTICE *of Motion to File Documents Under Seal* by CLS BANK INTERNATIONAL, CLS SERVICES LTD. re 60 MOTION for Order to *File Documents Under Seal* (Bickart, David) (Entered: 04/28/2009)
04/28/2009		MINUTE ORDER granting 60 CLS's motion to file documents under seal. Signed by Judge Rosemary M. Collyer on 4/28/09. (lcrmc2) (Entered: 04/28/2009)
04/28/2009	62	AFFIDAVIT *of Abigail Langsam in Support of CLS's Replies and Oppositions to Alice's Cross-Motions* by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Attachments: # 1 Exhibit 34, # 2 Exhibit 35, # 3 Exhibit 36, # 4 Exhibit 37, # 5 Exhibit 38, # 6 Exhibit 39, # 7 Exhibit 40, # 8 Exhibit 41, # 9 Exhibit 42, # 10 Exhibit 43, # 11 Exhibit 44, # 12 Exhibit 45, # 13 Exhibit 46, # 14 Exhibit 47, # 15 Exhibit 48, # 16 Exhibit 49, # 17 Exhibit 50, # 18 Exhibit 51, # 19 Exhibit 52, # 20 Exhibit 53, # 21 Exhibit 54, # 22 Exhibit 55, # 23

DATE FILED	#	DOCKET TEXT
		Exhibit 56, # 24 Exhibit 57, # 25 Exhibit 58, # 26 Exhibit 59, # 27 Exhibit 60, # 28 Exhibit 61, # 29 Exhibit 62, # 30 Exhibit 63, # 31 Exhibit 64, # 32 Exhibit 65)(Bickart, David) (Exhibits 36-48, 50-63 FILED UNDER SEAL) Modified on 4/30/2009 (rdj). (Entered: 04/28/2009)
04/28/2009	63	Memorandum in opposition to re 51 MOTION for Partial Summary Judgment *as to Extraterritoriality and Reply in Support of its Motion for Summary Judgment of No Infringement Within the United States* filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Attachments: # 1 Supplement CLS's Response to Alice's Counter-Statement of Material Facts Regarding Extraterritoriality) (Bickart, David) (FILED UNDER SEAL)Modified on 4/30/2009 (rdj). (Entered: 04/28/2009)
04/28/2009	64	Memorandum in opposition to re 54 Cross MOTION for Partial Summary Judgment *as to Subject Matter Eligibility that the Claims of Alice's Patents are Invalid for lack of Patentable*

DATE FILED	#	DOCKET TEXT
		Subject Matter, and in Opposition to Alice's Cross-Motion for Partial Summary Judgment as to Patent Eligibility filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Attachments: # 1 Supplement CLS's Response to Alice's Counter-Statement of Material Facts as to Subject Matter Eligibility) (Bickart, David) (FILED UNDER SEAL) Modified on 4/30/2009 (rdj). (Entered: 04/28/2009)
04/28/2009	65	REPLY to opposition to motion re 42 MOTION for Summary Judgment filed by CLS BANK INTERNATIONAL. (FILED UNDER SEAL) (rdj) (Entered: 05/01/2009)
05/19/2009	66	MOTION for Leave to File *Reply Memorandum Under Seal* by ALICE CORPORATION PTY. LTD. (Krinsky, David) (Entered: 05/19/2009)
05/19/2009	67	NOTICE *of Filing Reply Memorandum Under Seal* by ALICE CORPORATION PTY. LTD. re 51 MOTION for Partial Summary Judgment *as to Extraterritoriality* (Attachments: # 1 Declaration of David M. Krinsky, # 2 Exhibit 113, # 3 Exhibit 114, # 4 Exhibit 115, # 5

DATE FILED	#	DOCKET TEXT
		Exhibit 116, # 6 Exhibit 117, # 7 Exhibit 118, # 8 Exhibit 119, # 9 Exhibit 120, # 10 Exhibit 121)(Krinsky, David) (Entered: 05/19/2009)
05/19/2009		MINUTE ORDER granting 66 Alice's Motion for Leave to File its Reply Under Seal. Signed by Judge Rosemary M. Collyer on 5/19/09. (lcrmc2) (Entered: 05/19/2009)
05/19/2009	68	REPLY to opposition to motion re 54 Cross MOTION for Partial Summary Judgment *as to Subject Matter Eligibility* filed by ALICE CORPORATION PTY. LTD.. (Krinsky, David) (Entered: 05/19/2009)
05/19/2009	69	REPLY to opposition to motion re 51 MOTION for Partial Summary Judgment *as to Extraterritoriality* filed by ALICE CORPORATION PTY. LTD. (FILED UNDER SEAL) (rdj) (Entered: 05/21/2009)
06/04/2009	70	NOTICE OF SUPPLEMENTAL AUTHORITY by ALICE CORPORATION PTY. LTD. (Krinsky, David) (Entered: 06/04/2009)
06/12/2009	71	ORDER. On or before June 17, 2009, the parties shall show

DATE FILED	#	DOCKET TEXT
		cause in writing why the Court should not stay this case pending the Supreme Court's decision in Bilski and vacate the oral argument scheduled for June 19, 2009. Signed by Judge Rosemary M. Collyer on 6/12/09. (lcrmc2) (Entered: 06/12/2009)
06/12/2009		Set/Reset Deadlines/Hearings: Response to Show Cause Order due by 6/17/2009. (cdw) (Entered: 06/15/2009)
06/15/2009	72	RESPONSE TO ORDER OF THE COURT re 71 Order, filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Glassman, Steven) (Entered: 06/15/2009)
06/15/2009	73	RESPONSE TO ORDER TO SHOW CAUSE by ALICE CORPORATION PTY. LTD. re 71 Order,. (Krinsky, David) (Entered: 06/15/2009)
06/16/2009		MINUTE ORDER discharging 71 order to show cause; denying without prejudice to re-filing after the Supreme Court rules in Bilski 43 and 54 cross motions for summary judgment as to subject matter eligibility. The oral argument scheduled for June 19, 2009 shall be limited to

DATE FILED	#	DOCKET TEXT
		42 and 51 cross motions for summary judgment as to extraterritoriality. Signed by Judge Rosemary M. Collyer on 6/16/09. (lcrmc2) (Entered: 06/16/2009)
06/16/2009	74	NOTICE of Appearance by Bruce Roger Genderson on behalf of ALICE CORPORATION PTY. LTD. (Genderson, Bruce) (Entered: 06/16/2009)
06/19/2009		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Motion Hearing held on 6/19/2009. (Court Reporter: Crystal Pilgrim) (cdw) (Entered: 06/22/2009)
08/28/2009	75	NOTICE OF SUPPLEMENTAL AUTHORITY by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Glassman, Steven) (Entered: 08/28/2009)
09/03/2009	76	RESPONSE re 75 NOTICE OF SUPPLEMENTAL AUTHORITY filed by ALICE CORPORATION PTY. LTD.. (Krinsky, David) (Entered: 09/03/2009)
10/20/2009	78	ORDER denying 42 CLS Bank's Motion for Summary Judgment; denying without prejudice 51 Alice's Motion for Partial Summary Judgment. The parties

DATE FILED	#	DOCKET TEXT
		shall submit to Chambers a joint proposed redacted version of the Memorandum Opinion filed under seal no later than November 6, 2009. Signed by Judge Rosemary M. Collyer on 10/13/09. (lcrmc2) Modified on 10/20/2009 (zcdw,). (Entered: 10/20/2009)
10/20/2009		Set/Reset Deadlines: Redacted Memorandum Opinion due by 11/6/2009. (cdw) (Entered: 10/21/2009)
11/05/2009		NOTICE of Hearing: A Status Conference is set for 11/19/2009 at 10:45 AM in Courtroom 2 before Judge Rosemary M. Collyer. (cdw) (Entered: 11/05/2009)
11/06/2009	79	REDACTED MEMORANDUM OPINION. The material redacted from the Sealed Memorandum Opinion 77 is designated "Confidential" under the Protective Order 33 . Signed by Judge Rosemary M. Collyer on 10/13/09. (lcrmc2) (cdw,). (Entered: 11/06/2009)
11/16/2009	80	MOTION for Certification for interlocatory appeal *of this Court's order denying CLS' motion for summary judgment of*

DATE FILED	#	DOCKET TEXT
		no infringement within the United States by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 [PROPOSED] ORDER) (Glassman, Steven) (Entered: 11/16/2009)
11/18/2009	81	Memorandum in opposition to re 80 MOTION for Certification for interlocatory appeal *of this Court's order denying CLS' motion for summary judgment of no infringement within the United States* filed by ALICE CORPORATION PTY. LTD.. (Attachments: # 1 Text of Proposed Order)(Krinsky, David) (Entered: 11/18/2009)
11/19/2009		MINUTE ORDER. Pursuant to the status conference held in open Court on November 19, 2009, the parties shall jointly file a notice advising the Court that the Supreme Court has issued its ruling in Bilski. Signed by Judge Rosemary M. Collyer on 11/19/09. (lcrmc2) (Entered: 11/19/2009)
11/19/2009		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Status Conference held on 11/19/2009. (Court Reporter:

DATE FILED	#	DOCKET TEXT
		Crystal Pilgrim) (cdw) (Entered: 11/23/2009)
11/25/2009	82	REPLY to opposition to motion re 80 MOTION for Certification for interlocatory appeal *of this Court's order denying CLS' motion for summary judgment of no infringement within the United States* filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Bickart, David) (Entered: 11/25/2009)
12/03/2009	83	ORDER granting 80 CLS's Motion for Certificate of Appealability. The Court's October 13, 2009 Order 78 is CERTIFIED for immediate appeal. Signed by Judge Rosemary M. Collyer on 12/3/09. (lcrmc2) (Entered: 12/03/2009)
12/29/2009	84	NOTICE from the USCA for the Federal Circuit, (USCA Fed. Cir. Miscellaneous Case No. 922), re: the filing of a Petition for Permission to Appeal pursuant to 28 USC 1292(b) from the United States District Court for the District of Columbia. (kb) (Entered: 12/29/2009)
01/04/2010	85	TRANSCRIPT OF PROCEEDINGS before Judge Rosemary

DATE FILED	#	DOCKET TEXT
		M. Collyer held on November 19, 2009; Page Numbers: 1-12. Date of Issuance: 12/7/09. Court Reporter/Transcriber Crystal M. Pilgrim, Telephone number 202.354.3127, Court Reporter Email Address : crystal_pilgrim@dcd.uscourts.gov For the first 90 days after this filing date, the transcript may be viewed at the courthouse at a public terminal or purchased from the court reporter referenced above. After 90 days, the transcript may be accessed via PACER. Other transcript formats, (multi-page, condensed, CD or ASCII) may be purchased from the court reporter. NOTICE RE REDACTION OF TRANSCRIPTS: The parties have twenty-one days to file with the court and the court reporter any request to redact personal identifiers from this transcript. If no such requests are filed, the transcript will be made available to the public via PACER without redaction after 90 days. The policy, which includes the five personal identifiers specifically covered,

DATE FILED	#	DOCKET TEXT
		is located on our website at ww.dcd.uscourts.gov. Redaction Request due 1/25/2010. Redacted Transcript Deadline set for 2/4/2010. Release of Transcript Restriction set for 4/5/2010.(Pilgrim, Crystal) (Entered: 01/04/2010)
01/20/2010	86	REPORT on the filing or determination of an action regarding patent and/or trademark number(s) 5,901,479; 6,912,510; 7,149,720. (znmw,) (Entered: 01/20/2010)
02/03/2010	87	ORDER from the USCA for the Federal Circuit, (USCA Fed. Cir. Miscellaneous Case No. 922), it is ordered that the petition for permission to appeal is denied. (kb) (Entered: 02/17/2010)
07/01/2010	88	NOTICE re: Joint Notice of U.S. Supreme Court Decision in Bilski Case by ALICE CORPORATION PTY. LTD., CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Glassman, Steven) (Entered: 07/01/2010)
07/15/2010		MINUTE ORDER. Pursuant to the parties' joint notice [Dkt. # 88], a status conference is

DATE FILED	#	DOCKET TEXT
		scheduled for August 6, 2010 at 10:15 am. Signed by Judge Rosemary M. Collyer on 7/15/2010. (lcrmc2) (Entered: 07/15/2010)
07/15/2010		Set/Reset Hearings: Status Conference set for 8/6/2010 10:15 AM in Courtroom 2 before Judge Rosemary M. Collyer. (cdw) (Entered: 07/19/2010)
08/05/2010	89	Consent MOTION for Leave to File *Amended Answer and Counterclaims* by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Exhibit Proposed Amended Answer and Counterclaims of Defendant Alice Corporation Pty. Ltd., # 2 Text of Proposed Order)(Krinsky, David) (Entered: 08/05/2010)
08/05/2010		MINUTE ORDER granting 89 Defendant's Consent Motion for Leave to File an Amended Answer & Counterclaim. The Deputy Clerk shall docket the Amended Answer attached as exhibit to the Motion [Dkt. # 89]. Signed by Judge Rosemary M. Collyer on 8/5/2010. (lcrmc2) (Entered: 08/05/2010)

DATE FILED	#	DOCKET TEXT
08/05/2010	90	Amended ANSWER to 1 Complaint by ALICE CORPORATION PTY. LTD.(rdj) (Entered: 08/05/2010)
08/06/2010		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Status Conference held on 8/6/2010. (Court Reporter: Crystal Pilgrim) (cdw) (Entered: 08/09/2010)
08/11/2010	91	NOTICE of Proposed Order Setting Briefing and Document Discovery Schedule by ALICE CORPORATION PTY. LTD., CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Text of Proposed Order)(Krinsky, David) (Entered: 08/11/2010)
08/13/2010	92	SCHEDULING ORDER CLS's Summary Judgment motion due by 8/27/2010. Alice's Response to Motion for Summary Judgment due by 9/22/2010. CLS's Reply to Motion for Summary Judgment due by 10/8/2010. Alice's Cross Motion due by 9/22/2010. CLS's Response to Cross Motion due by 10/8/2010. Alice's Reply to Cross Motion due by 10/22/2010. Signed by Judge Rosemary M. Collyer on August 12, 2010. (zcdw,) (Entered: 08/13/2010)

DATE FILED	#	DOCKET TEXT
08/19/2010	93	REPLY re 90 Answer to Complaint filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Glassman, Steven) (Entered: 08/19/2010)
08/27/2010	94	MOTION for Summary Judgment *that the Claims of Alice's Patents are Invalid for Lack of Patentable Subject Matter* by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Text of Proposed Order, # 2 DECLARATION OF STEVEN J. GLASSMAN, # 3 Exhibt 1-Part A, # 4 Exhibit 1-Part B, # 5 Exhibit 2-Part A, # 6 Exhibit 2-Part B, # 7 Exhibit 3-Part A, # 8 Exhibit 3-Part B, # 9 Exhibit 4-Part A, # 10 Exhibit 4-Part B, # 11 Exhibit 5, # 12 Exhibit 6, # 13 Exhibit 7, # 14 Exhibit 8, # 15 Exhibit 9, # 16 Exhibit 10)(Glassman, Steven) (Entered: 08/27/2010)
09/22/2010	95	Cross MOTION for Summary Judgment *and Opposition to CLS Motion for Summary Judgment re Patent Eligibility Under 35 U.S.C. s 101* by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Text of Proposed Order, # 2 Declaration Declaration of Stanley E. Fisher,

DATE FILED	#	DOCKET TEXT
		# 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Exhibit 6, # 9 Exhibit 7, # 10 Exhibit 8) (Fisher, Stanley) (Entered: 09/22/2010)
09/23/2010	96	Memorandum in opposition to re 94 MOTION for Summary Judgment *that the Claims of Alice's Patents are Invalid for Lack of Patentable Subject Matter [REFILED PER COURT INSTRUCTION THAT OPPOSITION AND CROSS MOTION MUST BE E-FILED SEPARATELY]* filed by ALICE CORPORATION PTY. LTD.. (Attachments: # 1 Text of Proposed Order, # 2 Declaration Declaration of Stanley E. Fisher, # 3 Exhibit 1, # 4 Exhibit 2, # 5 Exhibit 3, # 6 Exhibit 4, # 7 Exhibit 5, # 8 Exhibit 6, # 9 Exhibit 7, # 10 Exhibit 8) (Fisher, Stanley) (Entered: 09/23/2010)
09/30/2010		NOTICE of Hearing: A Motion Hearing is set for 1/14/2011 at 10:00 AM in Courtroom 2 before Judge Rosemary M. Collyer. (cdw) (Entered: 09/30/2010)

DATE FILED	#	DOCKET TEXT
10/08/2010	97	REPLY re 94 MOTION for Summary Judgment , filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 CLS'S RESPONSE TO ALICE'S COUNTER-STATEMENT OF MATERIAL FACTS AS TO SUBJECT MATTER ELIGIBILITY) (Glassman, Steven) Modified on 10/12/2010 add correct linkage (rdj). (Entered: 10/08/2010)
10/08/2010	98	Memorandum in opposition to re 95 Cross MOTION for Summary Judgment *and Opposition to CLS Motion for Summary Judgment re Patent Eligibility Under 35 U.S.C. s 101* filed by CLS BANK INTERNATIONAL, CLS SERVICES LTD.. (Attachments: # 1 CLS'S RESPONSE TO ALICE'S COUNTER-STATEMENT OF MATERIAL FACTS AS TO SUBJECT MATTER ELIGIBILITY) (Glassman, Steven) (Entered: 10/08/2010)
10/22/2010	99	REPLY to opposition to motion re 95 Cross MOTION for Summary Judgment *and Opposition to CLS Motion for Summary Judgment re Patent Eligibility Under 35 U.S.C. s 101*

DATE FILED	#	DOCKET TEXT
		filed by ALICE CORPORATION PTY. LTD.. (Attachments: # 1 Declaration of Stanley E. Fisher, # 2 Exhibit 9)(Fisher, Stanley) (Entered: 10/22/2010)
12/09/2010	100	TRANSCRIPT OF PROCEEDINGS before Judge Rosemary M. Collyer held on 8/6/10; Page Numbers: 1-21. Date of Issuance: 9/9/10. Court Reporter/ Transcriber Crystal M. Pilgrim, Telephone number 202.354.3127, Court Reporter Email Address : crystal_pilgrim@dcd.uscourts.gov. For the first 90 days after this filing date, the transcript may be viewed at the courthouse at a public terminal or purchased from the court reporter referenced above. After 90 days, the transcript may be accessed via PACER. Other transcript formats, (multi-page, condensed, CD or ASCII) may be purchased from the court reporter. NOTICE RE REDACTION OF TRANSCRIPTS: The parties have twenty-one days to file with the court and the court reporter any request to redact personal identifiers from this transcript. If no such requests are filed, the transcript will be

DATE FILED	#	DOCKET TEXT
		made available to the public via PACER without redaction after 90 days. The policy, which includes the five personal identifiers specifically covered, is located on our website at www.dcd.uscourts.gov. Redaction Request due 12/30/2010. Redacted Transcript Deadline set for 1/9/2011. Release of Transcript Restriction set for 3/9/2011.(Pilgrim, Crystal) (Entered: 12/09/2010)
01/04/2011	101	NOTICE OF SUPPLEMENTAL AUTHORITY by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Exhibit Research Corp. Techs. v. Microsoft Corp., # 2 Exhibit Prometheus Labs, Inc. v. Mayo Collaborative Servs., # 3 Exhibit Chamberlain Group, Inc. v. Lear Corp.)(Krinsky, David) (Entered: 01/04/2011)
01/12/2011	102	NOTICE OF SUPPLEMENTAL AUTHORITY by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3)(Glassman, Steven) (Entered: 01/12/2011)

DATE FILED	#	DOCKET TEXT
01/13/2011	103	NOTICE OF SUPPLEMENTAL AUTHORITY by ALICE CORPORATION PTY. LTD. (Attachments: # 1 Exhibit Ex Parte Comer, # 2 Exhibit Ex Parte Kohda)(Krinsky, David) (Entered: 01/13/2011)
01/14/2011		Minute Entry for proceedings held before Judge Rosemary M. Collyer: Motion Hearing held on 1/14/2011 re 94, 95 Cross Motions for Summary Judgment. Motions heard and taken under advisement. (Court Reporter: Crystal Pilgrim) (cdw) (Entered: 01/19/2011)
03/09/2011	104	MEMORANDUM AND OPINION. Signed by Judge Rosemary M. Collyer on 3/9/2011. (lcrmc2) (Entered: 03/09/2011)
03/09/2011	105	ORDER. CLS Bank International's motion for summary judgment 94 is GRANTED and Alice Corporation's cross-motion for partial summary judgment 95 is DENIED. See simultaneously filed Memorandum Opinion for reasoning. Signed by Judge Rosemary M. Collyer on 3/9/2011. (lcrmc2) (Entered: 03/09/2011)

DATE FILED	#	DOCKET TEXT
03/10/2011	106	FINAL REPORT on the filing or determination of an action regarding a patent and/or trademark. (znmw,) (Entered: 03/10/2011)
03/11/2011	107	AMENDED FINAL REPORT on the filing or determination of an action regarding a patent and/or trademark. (znmw,) (Entered: 03/11/2011)
03/18/2011	108	NOTICE OF APPEAL as to 105 Order on Motion for Summary Judgment,,, 104 Memorandum & Opinion by ALICE CORPORATION PTY. LTD.. Filing fee $ 455, receipt number 0090-2470896. Fee Status: Fee Paid. Parties have been notified. (Krinsky, David) (Entered: 03/18/2011)
03/30/2011	109	Transmission of the Notice of Appeal, Order Appealed, and Docket Sheet to US Court of Appeals for the Federal Circuit. The Court of Appeals fee was paid this date re 108 Notice of Appeal. (rdj) Modified on 3/30/2011 to correct transmission (rdj). (Entered: 03/22/2011)
04/08/2011	110	TRANSCRIPT OF PROCEEDINGS before Judge Rosemary M. Collyer held on January 14,

DATE FILED	#	DOCKET TEXT
		2011; Page Numbers: 1-68. Date of Issuance: 2/24/11. Court Reporter/Transcriber Crystal M. Pilgrim, Telephone number 202.354.3127, Court Reporter Email Address : crystalpilgrim@aol.com. For the first 90 days after this filing date, the transcript may be viewed at the courthouse at a public terminal or purchased from the court reporter referenced above. After 90 days, the transcript may be accessed via PACER. Other transcript formats, (multi-page, condensed, CD or ASCII) may be purchased from the court reporter. NOTICE RE REDACTION OF TRANSCRIPTS: The parties have twenty-one days to file with the court and the court reporter any request to redact personal identifiers from this transcript. If no such requests are filed, the transcript wil be made available to the public via PACER without redaction after 90 days. The policy, which includes the five personal identifiers specifical y covered, is located on our website at ww.dcd.uscourts.gov.

DATE FILED	#	DOCKET TEXT
		Redaction Request due 4/29/2011. Redacted Transcript Deadline set for 5/9/2011. Release of Transcript Restriction set for 7/7/2011.(Pilgrim, Crystal) (Entered: 04/08/2011)
04/11/2011	111	NOTICE of Docketing re 108 Notice of Appeal. USCA for the Federal Circuit Case Number 2011-1301. (zsmm) (Entered: 04/15/2011)
07/10/2012	112	NOTICE OF Entry of Judgment Accompanied by Opinion re 108 Notice of Appeal to DC Circuit Court. (USCA for the Federal Circuit Case No. 2011-1301) (kb) (Entered: 07/12/2012)
05/14/2013	113	USCA for the Federal Circuit OPINION and JUDGMENT (USCA for the Fed. Cir. Case Number 2011-1301) as to 108 Notice of Appeal to DC Circuit Court filed by ALICE CORPORATION PTY. LTD. The judgment or decision is: AFFIRMED. (Attachments: # 1 Notice of Entry of Judgment Accompanied by Opinion)(kb) (Entered: 05/14/2013)
06/17/2013	114	NOTICE of Appearance by Mark A. Perry on behalf of CLS BANK INTERNATIONAL, CLS

DATE FILED	#	DOCKET TEXT
		SERVICES LTD. (Perry, Mark) (Entered: 06/17/2013)
06/17/2013	115	NOTICE of Appearance by Brian Mark Buroker on behalf of CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Buroker, Brian) (Entered: 06/17/2013)
06/17/2013	116	MOTION for Leave to Appear Pro Hac Vice :Attorney Name- Alexander N. Harris, :Firm- Gibson Dunn & Crutcher LLP, :Address- 1050 Connecticut Avenue N.W., Washington, District of Columbia 20036. Phone No. - (202) 887-3554. Fax No. -(202) 530-9685 by CLS BANK INTERNATIONAL, CLS SERVICES LTD. (Buroker, Brian) (Entered: 06/17/2013)
06/19/2013		MINUTE ORDER. The Deputy Clerk shall schedule a status conference in consultation with the parties. Signed by Judge Rosemary M. Collyer on 6/19/2013. (lcrmc2) (Entered: 06/19/2013)
06/21/2013	117	Joint MOTION for Extension of Time to *Move for Costs and Fees* by CLS BANKINTERNATIONAL, CLS SERVICES LTD. (Buroker, Brian) (Entered: 06/21/2013)

DATE FILED	#	DOCKET TEXT
06/21/2013		MINUTE ORDER granting 116 Motion for Leave to Appear Pro Hac Vice as to Alexander N. Harris; granting as unopposed 117 Motion for Extension of Time to File Fee Petition. Any fee petition may be filed no more than 21 days after the last of: (1) the deadline for filing a petition for certiorari expires; (2) the Supreme Court denies the petition for certiorari; or (3) in the event the Supreme Court reviews the case and the judgment is affirmed, the date the Supreme Court sends a certified copy of the judgment to the Federal Circuit (see S. Ct. R. 45.3), or (4) in the event the Supreme Court reviews the case and remands, the date of resolution of proceedings on remand. The Court's Minute Order dated June 19, 2013 scheduling a status conference is VACATED. Signed by Judge Rosemary M. Collyer on 6/21/2013. (lcrmc2) (Entered: 06/21/2013)

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

2011-1301

CLS BANK,

v.

ALICE CORPORATION

RELEVANT DOCKET ENTRIES

DATE	HISTORY
1/23/2013	Appellant Principal Brief Filing Date
11/30/2012	Appellee or Cross Appellant Principal Brief Filing Date
//	Appellant Reply Brief Filing Date
1/25/2013	Cross Appellant Reply Brief Filing Date
//	Appendix Filing Date
2/8/2013	Oral Argument Date / Calendared
5/10/2013	Disposition: Affirmed ; by Banc
12:00:00 AM	Mandated on
1/30/2013	MOTION: Entry 190 :by Amici - Motion for Leave for Amici Curiae The Clearing House Association L.L.C. and the Financial Services Roundtable to Participate in Oral

DATE	MOTIONS AND OTHER ENTRIES
	Argument. SERVICE : by Mail on 1/30/2013
	ACTION: Entry 193:Denied. Filed: 2/1/2013
1/18/2013	MOTION: Entry 168 :by Amicus - Unopposed Motion of the United States for Leave to Participate in Oral Argument. SERVICE : by Mail on 1/18/2013
	ACTION: Entry 189:Granted. Filed: 1/29/2013
11/29/2012	MOTION: Entry 77 :by Other - Unopposed Motion of the United States for 7-day Extension of Time in Which to File a Brief as Amicus Curiae SERVICE : by Mail on 11/29/2012
	ACTION: Entry 81 :Granted. The brief is due December 14, 2012. Filed: 12/4/2012
10/12/2012	MOTION: Entry 69 :by Appellees - Consented Motion to Extend Time and Set Dates for All En Banc Briefs SERVICE : by Mail on 10/12/2012
	ACTION: Entry 70 :The motion is granted. See order for revised deadlines. Filed: 10/17/2012
9/28/2012	MOTION: Entry 64 :by Appellees - Motion for Leave to File Reply Brief in Support of Rehearing En Banc

DATE	MOTIONS AND OTHER ENTRIES
	(reply brief is received) SERVICE : by Mail on 9/28/2012 ACTION: Entry 72 :The motion is denied as moot. Filed: 10/19/2012
9/6/2012	MOTION: Entry 52 :by Other - Motion for Leave to File Brief of Amici Curiae Electronic Frontier Foundation and Public Knowledge in Support of Plaintiff/Appellee CLS Bank International's and Counterclaim-Defendant Appellee CLS Services, Ltd.'s Motion for Rehearing En Banc SERVICE : by Mail on 9/5/2012 ACTION: Entry 57 :The motion is granted. The brief is accepted for filing. Filed: 9/10/2012
9/5/2012	MOTION: Entry 51 :by Other - Motion of Google Inc., Hewlett-Packard Co., Red Hat, Inc., and Twitter Inc. for Leave to File a Brief as Amici Curiae in Support of Petitioner SERVICE : by Mail on 9/5/2012 ACTION: Entry 58 :The motion is granted. The amici brief is accepted for filing. Filed: 9/10/2012
9/5/2012	MOTION: Entry 50 :by Amici - Unopposed Motion for Leave to File Brief of Amici Curiae British Airways PLC, EHarmony, Inc., Intuit Inc., Linkedin Corp., SAP

DATE	MOTIONS AND OTHER ENTRIES
	America, Inc., and Travelocity.com LP in Support of Rehearing En Banc (In Support of Neither Party) SERVICE : by Mail on 9/5/2012
	ACTION: Entry 53 :The motion is granted. The amici brief is accepted for filing. Filed: 9/7/2012
8/27/2012	MOTION: Entry 48 :by Appellant - Unopposed Motion for Extension of Time to File Appellant's Response to Petition for Rehearing En Banc SERVICE : by Mail on 8/27/2012
	ACTION: Entry 49 :The motion is granted. Appellant's response to the petition is due by September 20, 2012. Filed: 8/29/2012
7/26/2012	MOTION: Entry 45 :by Appellees - Unopposed Motion for Extension of Time to File Appellees' Petition for Rehearing En Banc. SERVICE : by Mail on 7/26/2012
	ACTION: Entry 46 :Motion granted. The petition for rehearing en banc is due on or before August 22, 2012. Filed: 7/30/2012
7/25/2012	MOTION: Entry 41 :by Appellees - Motions for withdrawal of (4) Counsel. SERVICE : by Mail on 7/25/2012
	ACTION: Entry 42 :Granted. Filed: 7/27/2012

DATE	MOTIONS AND OTHER ENTRIES
5/13/2011	MOTION: Entry 20 :by Joint - Motion to Revise the briefing schedule. SERVICE : by Mail on 5/13/2011 ACTION: Entry 21 :Motion granted. Alice's brief is due June 24, 2011, CLS's brief is due August 22, 2011, and Alice's reply brief is due September 16, 2011. Filed: 5/19/2011

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 200 :	Mailed : 3/25/2013, Notice to Parties Regarding Electronic Filing: This case has been assigned to the court's CMECF system. All further filings in this appeal must be made using ECF SERVICE : by Court on 3/25/2013
Entry 199 :	Entered : 2/8/2013, Submitted after ORAL ARGUMENT by Adam L. Perlman and Mark A. Perry, Nathan K. Kelley. Panel: , En Banc and .
Entry 197 :	Filed : 1/30/2013, Certificate of Interest for amicus curiae University of New Hampshire School of Law. SERVICE : by Mail on 1/30/2013
Entry 196 :	Filed : 1/30/2013, Entry of Appearance for Joseph Jeffrey Hawley as of counsel for amicus curiae University of New Hampshire School of Law SERVICE : by Mail on 1/30/2013
Entry 195 :	Filed : 1/30/2013, Entry of Appearance for Ann M. McCrackin as principal counsel for amicus curiae University of New Hampshire School of Law. SERVICE : by Mail on 1/24/2013
Entry 191 :	Received : 1/30/2013, Response to Oral Argument Order from the amicus curiae, Director of the Patent and Trademark Office, stating that Nathan K. Kelley will argue.

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	SERVICE : by Mail on 1/30/2013
Entry 179 :	Filed : 1/18/2013, Certificate of Interest for amici curiae, TeleCommunication Systems, Inc. and Dr. Bakul Banerjee. SERVICE : by Mail on 1/18/2013 DOC : : CLS Bank 2011-1301 (1.18.13 COI TELECOMM. SYSTEMS, INC. & BAKUL BANERJEE).PDF
Entry 178 :	Filed : 1/18/2013, Entry of Appearnace for Robert P. Greenspoon as principal counsel on behalf of amici curiae, TeleCommunication Systems, Inc. and Dr. Bakul Banerjee. SERVICE : by Mail on 1/18/2013 DOC : : CLS Bank 2011-1301 (1.18.13 EOA GREENSPOON).PDF
Entry 174 :	Filed : 1/18/2013, Entry of Appearnace for David A. Perlson as principal counsel on behalf of amicus curiae, Bancorp Services, LLC. SERVICE : by Mail on 1/18/2013 DOC : : CLS Bank 2011-1301 (1.18.13 EOA PERLSON).pdf
Entry 187 :	Filed : 1/17/2013, Entry of Appearance for Dale R. Cook, appearing pro se as an amicus curiae party. SERVICE : by Mail on 1/17/2013

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	DOC : : CLS Bank 2011-1301 (1.17.13 EOA COOK).PDF
Entry 186 :	Filed : 1/17/2013, Entry of Appearance for Gary A. Rosen as counsel on behalf of amici curiae, BGC Partners, Inc. & Cantor Fitzgerald, LP. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.17.13 EOA ROSEN).PDF
Entry 185 :	Filed : 1/17/2013, Entry of Appearance for David E. Boundy as principal counsel on behalf of amici curiae BGC Partners, Inc. & Cantor Fitzgerald, LP. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.17.13 EOA BOUNDY).PDF
Entry 184 :	Filed : 1/17/2013, Certificate of Interest for amici curiae, BGC Partners, Inc. and Cantor Fitzgerald, LP. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.17.13 COI BGC PARTNERS. INS & CANTOR FITZGERALD, LP).PDF
Entry 183 :	Filed : 1/17/2013, Certificate of Interest for amicus curiae, The American Intellectual Property Law Association.

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.17.13 COI THE AMERICAN INTELLECTUAL PROPERTY LAW ASSOCIATION).PDF
Entry 181 :	Filed : 1/17/2013, Entry of Appearance for Gero McClellan as counsel on behalf of amicus curiae, The American Intellectual Property Law Association. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.17.13 EOA McCLELLAN).PDF
Entry 180 :	Filed : 1/17/2013, Entry of Appearance for Jerry R. Selinger as principal counsel on behalf of amicus curiae, The American Intellectual Property Law Association. SERVICE : by Mail on 1/16/2013 DOC : : CLS Bank 2011-1301 (1.17.13 EOA SELINGER).PDF
Entry 177 :	Filed : 1/17/2013, Certificate of Interest for amicus curiae, Trading Technologies International, Inc. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.18.13 COI TRADING TECH).pdf

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 176 :	Filed : 1/17/2013, Entry of Appearance for Steven F. Borsand as principal counsel on behalf of amicus curiae, Trading Technologies International. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.18.13 EOA BORSAND).pdf
Entry 175 :	Filed : 1/17/2013, Entry of Appearance for Ian S. Shelton as counsel on behalf of amicus curiae, Bancorp Services, LLC. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 1.18.13 EOA SHELTON).pdf
Entry 173 :	Filed : 1/17/2013, Entry of Appearance for Charles K. Verhoeven as counsel on behalf of amicus curiae, Bancorp Services, LLC. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.18.13 EOA VERHOEVEN).pdf
Entry 172 :	Filed : 1/17/2013, Certificate of Interest for amicus curiae Bancorp Services, LLC. SERVICE : by Mail on 1/17/2013 DOC : : CLS Bank 2011-1301 (1.18.13 COI BANCORP).pdf

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 182 :	Filed : 1/16/2013, Entry of Appearance for Jeffrey I.D. Lewis as counsel on behalf of amicus curiae, The American Intellectual Property Law Association. SERVICE : by Mail on 1/16/2013 DOC : : CLS Bank 2011-1301 (1.17.13 EOA LEWIS).PDF
Entry 162 :	Filed : 1/14/2013, Entry of Appearance for Robert Sokohl as counsel on behalf of Appellant Alice Corporation Pty. Ltd. SERVICE : by Mail on 1/10/2013 DOC : : CLS BANK V ALICE CORP 2011-1301 (1.14.13 EOA SOKOHL).pdf
Entry 159 :	Received : 12/26/2012, Response to oral argument order from the appellant, Alice Corporation Pty. Ltd. stating that Adam L. Perlman will argue. SERVICE : by Mail on 12/21/2012
Entry 158 :	Entered : 12/21/2012, NOTICE OF CALENDARING issued. Panel: 1302A on February 8, 2013.
Entry 160 :	Received : 12/19/2012, Response to oral argument order from the appellee, CLS Bank International stating that Mark A. Perry will argue.

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	SERVICE : by Mail on 12/19/2012
Entry 157 :	Filed : 12/14/2012, Amended Entry of Appearance for Thomas W. Krause as counsel on behalf of Amicus Curiae United States SERVICE : by Mail on 12/14/2012
Entry 156 :	Filed : 12/14/2012, Amended Entry of Appearance for Scott C. Weidenfeller as counsel on behalf of Amicus Curiae United States SERVICE : by Mail on 12/14/2012
Entry 155 :	Filed : 12/14/2012, Amended Entry of Appearance for Nathan K. Kelley as counsel on behalf of Amicus Curiae United States SERVICE : by Mail on 12/14/2012
Entry 154 :	Filed : 12/14/2012, Amended Entry of Appearance for Bernard J. Knight, Jr. as counsel on behalf of Amicus Curiae United States SERVICE : by Mail on 12/14/2012
Entry 153 :	Filed : 12/14/2012, Amended Entry of Appearance for Raymon T. Chen as counsel on behalf of Amicus Curiae United States SERVICE : by Mail on 12/14/2012 DOC : : CLS Bank 2011-1301 (12.14.12 EOA CHEN).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 151 :	Filed : 12/13/2012, Entry of Appearance for Scott C. Weidenfeller as counsel on behalf of Amicus Curiae Director-U.S. Patent and Trademark Office SERVICE : by Mail on 12/12/2012 DOC : : CLS Bank 2011-1301 (12.13.12 EOA WEIDENFELLER). PDF
Entry 150 :	Filed : 12/13/2012, Entry of Appearance for Raymon T. Chen as counsel on behalf of Amicus Curiae Director-U.S. Patent and Trademark Office SERVICE : by Mail on 12/12/2012 DOC : : CLS Bank 2011-1301 (12.13.12 EOA CHEN).PDF
Entry 149 :	Filed : 12/13/2012, Entry of appearance for Thomas W. Krause as counsel on behalf of Amicus Curiae Director- United States Patent & Trademark Office SERVICE : by Mail on 12/12/2012 DOC : : CLS Bank 2011-1301 (12.13.12 EOA KRAUSE).PDF
Entry 148 :	Filed : 12/13/2012, Entry of Appearance for Bernard J. Knight, Jr. As counsel on behalf of Amicus Curiae Director-US Patent and Trademark Office

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	SERVICE : by Mail on 12/13/2012 DOC : : CLS Bank 2011-1301 (12.13.12 EOA KNIGHT).PDF
Entry 147 :	Filed : 12/13/2012, Entry of Appearance for Nathan K. Kelly As counsel on behalf of Amicus Curiae Director-US Patent and Trademark Office SERVICE : by Mail on 12/13/2012 DOC : : CLS Bank 2011-1301 (12.13.12 EOA KELLEY).PDF
Entry 144 :	Filed : 12/11/2012, Entry of Appearance for Scott R. McIntosh as counsel on behalf of Amicus Curiae United States of America SERVICE : by Mail on 11/29/2012 DOC : : CLS Bank 2011-1301 (12.11.12 EOA MCINTOSH).PDF
Entry 99 :	Filed : 12/7/2012, Entry of Appearance for John D. Vandenberg as principal counsel for Amicus Curiae British Airways Plc, et al. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA VANDENBERG).PDF
Entry 94 :	Filed : 12/7/2012, Entry of Appearance for Michael Barclay as counsel on behalf of Amicus Electronic Frontier

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	Foundation SERVICE : by Mail on 12/6/2012 DOC : : CLS Bank 2011-1301 (12.06.12 EOA BARCLAY).pdf
Entry 127 :	Filed : 12/7/2012, Entry of Appearance for Manny W. Schecter as of council on behalf of the amicus curiae, International Business Machines Corporation. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA SCHECTER).PDF
Entry 126 :	Filed : 12/7/2012, Entry of Appearance for Kenneth R. Corsello as of council on behalf of the amicus curiae, International Business Machines Corporation. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA CORSELLO).PDF
Entry 125 :	Filed : 12/7/2012, Entry of Appearance for D. Zachary Hudson as of council on behalf of the amicus curiae, International Business Machines Corporation. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA HUDSON).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 124 :	Filed : 12/7/2012, Certificate of Interest for amicus curiae, International Business Machines Corporation. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 COI INTERNATIONAL BUSINESS MACHINES CORP.).PDF
Entry 123 :	Filed : 12/7/2012, Entry of Appearance for Paul D. Clement as principal council on behalf of the amicus curiae, International Business Machines Corporation SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA CLEMENT).PDF
Entry 122 :	Filed : 12/7/2012, Certificate of Interest for amicus curiaes, The Chearing House Association L.L.C. and The Financial Services Roundtable SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 COI THE CLEARING HOUSE ASSOC.).PDF
Entry 121 :	Filed : 12/7/2012, Entry of Appearance for Susan M. Davies as principal council on behalf of the amicus curiae, The Clearing House

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	Association L.L.C. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA DAVIES).PDF
Entry 120 :	Filed : 12/7/2012, Entry of Appearance for Liam P. Hardy as of council on behalf of Amicus Curiae The Clearing House Association L.L.C. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA HARDY).PDF
Entry 119 :	Filed : 12/7/2012, Entry of Appearance for George L. Graff as principal counsel on behalf of the amicus curiae, Intellectual Property Owners Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA GRAFF).PDF
Entry 118 :	Filed : 12/7/2012, Entry of Appearance for Richard F. Phillips as counsel on behalf of the amicus curiae, Intellectual Property Owners Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA PHILLIPS).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 117 :	Filed : 12/7/2012, Entry of Appearance for Kevin H. Rhodes as counsel on behalf of the amicus curiae, Intellectual Property Owners Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA RHODES).PDF
Entry 116 :	Filed : 12/7/2012, Entry of Appearance for Herbert C. Wamsley as counsel on behalf of the amicus curiae, Intellectual Property Owners Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA WAMSLEY).PDF
Entry 115 :	Filed : 12/7/2012, Certificate of Interest for Intellectual Property Owners Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.7.12 COI INTELLECTUAL PROPERTY OWNERS ASSOC).PDF
Entry 102 :	Filed : 12/7/2012, Certificate of Interest for Amicus Computer & Commmunications Industry Association (CCIA) SERVICE : by Mail on 12/7/2012

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	DOC : : CLS Bank 2011-1301 (12.7.12 COI CCIA).PDF
Entry 101 :	Filed : 12/7/2012, Entry of Appearance for Matthew Schruers as principal counsel on behalf of Amicus Curiae Computer & Comms Industry Association (CCIA)
	SERVICE : by Mail on 12/7/2012
	DOC : : CLS Bank 2011-1301 (12.7.12 EOA SCHRUERS).PDF
Entry 100 :	Filed : 12/7/2012, Certificate of Interest for Amicus Curiae British Airways Plc, eHarmoney, Inc., Intuit Inc., et al.
	SERVICE : by Mail on 12/7/2012
	DOC : : CLS Bank 2011-1301 (12.7.12 COI BRITISH AIRWAYS, ET AL.).PDF
Entry 98 :	Filed : 12/6/2012, Entry of Appearance for Anthony F. Lo Cicero as counsel on behalf of Amicus Curiae New York Intellectual Property Law Association.
	SERVICE : by Mail on 12/6/2012
	DOC : : CLS Bank 2011-1301 (12.7.12 EOA LO CICERO).PDF
Entry 97 :	Filed : 12/6/2012, Entry of Appearance for Charles R. Macedo as principal counsel on behalf of Amicus Curiae

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	New York Intellectual Property Law Association. SERVICE : by Mail on 12/6/2012 DOC : : CLS Bank 2011-1301 (12.7.12 EOA MACEDO).PDF
Entry 96 :	Filed : 12/6/2012, Entry of Appearance for Michael J Kasdan as counsel on behalf of Amicus New York Intellectual Property Law Association SERVICE : by Mail on 12/6/2012 DOC : : CLS BANK 2011-1301 (12.7.12 EOA KASDAN).PDF
Entry 95 :	Mailed : 12/6/2012, Certificate of Interest for New York Intellectual Property Law Association as Amicus Curiae SERVICE : by Mail on 12/6/2012 DOC : : CLS Bank 2011-1301 (12.07.12 COI NEW YORK INTEL. PROP. LAW ASSOC.).PDF
Entry 114 :	Filed : 12/6/2012, Entry of Appearance for Mark A. Goldstein as counsel on behalf of the amicus curiae, Conejo Valley Bar Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.6.12 EOA GOLDSTEIN).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 113 :	Filed : 12/6/2012, Entry of Appearance for Steven C. Sereboff as principal counsel on behalf of the amicus curiae, Conejo Valley Bar Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.6.12 EOA SEREBOFF).PDF
Entry 112 :	Filed : 12/6/2012, Entry of Appearance for M. Kala Sarvaiya as counsel on behalf of the amicus curiae, Conejo Valley Bar Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.6.12 EOA SARVAIYA).PDF
Entry 111 :	Filed : 12/6/2012, Entry of Appearance for Jonathan Pearce as counsel on behalf of the amicus curiae, Conejo Valley Bar Association. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.6.12 EOA PEARCE).PDF
Entry 110 :	Filed : 12/6/2012, Entry of Appearance for Michael R. Dzwonczyk as principal counsel on behalf of the amicus curiae, Sigram Schindler Beteiligungsgesellschaft mbH. SERVICE : by Mail on 12/6/2012 DOC : : CLS Bank 2011-1301 (12.6.12 EOA DZWONCZYK).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 109 :	Filed : 12/6/2012, Entry of Appearance for Paul W. Hughes as counsel on behalf of the amicus curiae, BSA The Software Alliance. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.6.12 EOA HUGHES).PDF
Entry 108 :	Filed : 12/6/2012, Entry of Appearance for Andrew J. Pincus as principal counsel on behalf of the amicus curiae, BSA The Software Alliance. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.6.12 EOA PINCUS).PDF
Entry 107 :	Filed : 12/6/2012, Certificate of Interest for BSA The Software Alliance. SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (12.6.12 COI BSA THE SOFTWARE ALLIANCE).PDF
Entry 92 :	Filed : 12/5/2012, Entry of Appearance for Paul R. Juhasz as principal counsel on behalf of Amicus Curiae, The Juhasz Law Firm, P.C. SERVICE : by Mail on 12/4/2012 DOC : : CLS Bank 2011-1301 (12.5.12 EOA JUHASZ).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 91 :	Filed : 12/5/2012, Entry of Appearance for Charles W. Shifley as principal counsel for Amicus Curiae, The Intellectual Property Law Association of Chicago. SERVICE : by Mail on 12/4/2012 DOC : : CLS Bank 2011-1301 (12.5.12 EOA SHIFLEY).PDF
Entry 87 :	Filed : 12/5/2012, Certificate of Interest for The Intellectual Property Law Association of Chicago SERVICE : by Mail on 12/4/2012 DOC : : CLS Bank 2011-1301 (12.05.12 COI INTELLECTUAL LAW CHICAGO).pdf
Entry 142 :	Filed : 12/5/2012, Certificate of Interest for The Juhasz Law Firm, P.C. as Amicus Curiae SERVICE : by Mail on 12/4/2012 DOC : : CLS Bank 2011-1301 (12.5.12 COI THE JUHASZ LAW FIRM).PDF
Entry 141 :	Filed : 12/3/2012, Entry of Appearance forStacy O. Stitham counsel on behalf of Amicus Curiae Internet Retailers (Crutchfield Corp, et al.) SERVICE : by Mail on 11/30/2012 DOC : : CLS Bank 2011-1301 (12.3.12 EOA STITHAM).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 140 :	Filed : 12/3/2012, Entry of Appearance for David Swetnam-Burland as counsel on behalf of Amicus Curiae Internet Retailers (Crutchfield Corp, et al.) SERVICE : by Mail on 11/30/2012 DOC : : CLS Bank 2011-1301 (12.3.12 EOA BURLAND).PDF
Entry 139 :	Filed : 12/3/2012, Entry of Appearance for Peter J. Brann as principal counsel on behalf of Amicus Curiae Internet Retailers (Crutchfield Corp, et al.) SERVICE : by Mail on 11/30/2012 DOC : : CLS Bank 2011-1301 (12.3.12 EOA BRANN).PDF
Entry 138 :	Filed : 12/3/2012, Certificate of Interest for Amicus Curiae Internet Retailers (Crutchfield Corp, LL Bean, Newegg Inc., Overstock.com Inc., Presidio INternational, Inc.) SERVICE : by Mail on 11/30/2012 DOC : : CLS Bank 2011-1301 (12.3.12 COI CRUTCHFIELD CORP).PDF
Entry 93 :	Filed : 11/30/2012, Entry of Appearance for Peter K. Trzyna as principal counsel on behalf of Amicus Curiae, Lee Hollaar and Peter K. Trzyna.

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	SERVICE : by Mail on 11/30/2012 DOC : : CLS Bank 2011-1301 (11.30.12 EOA TRZYNA).PDF
Entry 130 :	Filed : 11/30/2012, Certificate of Interest for the amicus curiae, Lee Hollaar and Peter K. Trzyna SERVICE : by Mail on 12/7/2012 DOC : : CLS Bank 2011-1301 (11.30.12 COI HOLLAAR, ET AL.).PDF
Entry 86 :	Filed : 11/29/2012, Certificate of Interest for Amicus Curiae Koninklijke Philips Electronics NV. SERVICE : by Mail on 11/27/2012
Entry 85 :	Filed : 11/29/2012, Entry of Appearance for Paul Im as of counsel for Amicus Curiae Koninklijke Philips Electronics NV. SERVICE : by Mail on 11/26/2012
Entry 84 :	Filed : 11/29/2012, Entry of Appearance for Michael Fuerch as of counsel for Amicus Curiae Koninklijke Philips Electronics NV. SERVICE : by Mail on 11/26/2012
Entry 83 :	Filed : 11/29/2012, Entry of appearance for David Schreiber as of counsel for Amicus Curiae

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	Koninklijke Philips Electronics NV. SERVICE : by Mail on 11/28/2012
Entry 82 :	Filed : 11/29/2012, Entry of appearance for Jack E. Haken as principal attorney for Amicus Curiae Koninklijke Philips Electronic NV. SERVICE : by Mail on 11/27/2012
Entry 137 :	Filed : 11/27/2012, Entry of Appearance for Alexander Norman Harris as counsel on behalf of Appellee- CLS Bank International SERVICE : by Mail on 11/27/2012 DOC : : CLS Bank 2011-1301 (11.27.12 EOA HARRIS).PDF
Entry 136 :	Filed : 11/26/2012, Amended Certificate of Interest for Appellee, CLS Bank International and CLS Services, Ltd. SERVICE : by Mail on 11/26/2012 DOC : : CLS Bank 2011-1301 (11.26.12 COI CLS BANK INTERNATIONAL, ET AL.).PDF
Entry 76 :	Filed : 11/21/2012, Entry of Appearance for Michael Valek as counsel on behalf of the appellees, CLS Bank International, et al. SERVICE : by Mail on 11/21/2012 DOC : : CLS Bank 2011-1301

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	(11.21.12 EOA VALEK).PDF
Entry 74 :	Filed : 11/1/2012, Entry of Appearance for Stephen R. Stites acting as pro se amicus curiae. SERVICE : by Mail on 11/1/2012
Entry 71 :	Filed : 10/18/2012, NOTICE OF CALENDARING SENT TO PARTIES: Panel 1302A on February 8, 2013. SERVICE : by Court on 10/18/2012
Entry 67 :	Entered : 10/9/2012, (continued): and (4) See order for details regarding issues to be brief, filing requirements, participation by amici curiae, and oral argument. En banc. PER CURIAM. SERVICE : by Court on 10/9/2012
Entry 66 :	Filed : 10/9/2012, ORDERED: (1) The petition of CLS Bank for rehearing en banc is granted; (2) the court's opinion of 7/9/12 ia vacated and reinstated; (3) the parteis are requested to file new briefs; (con't) SERVICE : by Court on 10/9/2012
Entry 54 :	Entered : 9/7/2012, Brief of amici curiae British Airways, Plc, et al. is accepted for filing.
Entry 60 :	Filed : 9/6/2012, Entry of Appearance for Julie P. Samuels as principal

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	counsel on behalf of Amicus Curiae, Electronic Frontier Foundation. SERVICE : by Mail on 9/6/2012 DOC : : CLS Bank 2011-1301 (9.6.12 EOA SAMUELS).PDF
Entry 59 :	Filed : 9/6/2012, Certificate of Interest for Amicus Curiae, Electronic Frontier Foundation. SERVICE : by Mail on 9/6/2012 DOC : : CLS Bank 2011-1301 (9.6.12 COI ELECTRONIC FRONTIER FOUNDATION).PDF
Entry 63 :	Filed : 9/5/2012, Certificate of Interest for Amicus Curiae, Google Inc., et al. SERVICE : by Mail on 9/5/2012 DOC : : CLS Bank 2011-1301 (9.5.12 COI GOOGLE, INC. ET AL.).PDF
Entry 62 :	Filed : 9/5/2012, Entry of Appearance for Adam M. Conrad as counsel on behalf of Amicus Curiae, Google, Inc. et al. SERVICE : by Mail on 9/5/2012 DOC : : CLS Bank 2011-1301 (9.5.12 EOA CONRAD).PDF
Entry 61 :	Filed : 9/5/2012, Entry of Appearance for Daryl L. Joseffer as principal counsel on behalf of Amicus Curiae,

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	Google, Inc. et al. SERVICE : by Mail on 9/5/2012 DOC : : CLS Bank 2011-1301 (9.5.12 EOA JOSEFFER).PDF
Entry 56 :	Filed : 9/5/2012, Certificate of Interest for Amicus Curiae, British Airways Plc, et al. SERVICE : by Mail on 9/5/2012 DOC : : CLS Bank 2011-1301 (9.5.12 COI BRITISH AIRWAYS ET AL.).PDF
Entry 55 :	Filed : 9/5/2012, Entry of Appearane for John D. Vandenberg as principal counsel on behalf of Amicus Curiae, British Airways Plc, et al. SERVICE : by Mail on 9/4/2012 DOC : : CLS Bank 2011-1301 (9.5.12 EOA VANDENBERG).PDF
Entry 44 :	Filed : 7/27/2012, Amended Certificate of Interest for the appellees, CLS Bank International, et al. SERVICE : by Mail on 7/24/2012 DOC : : CLS Bank 2011-1301 (7.27.12 COI CLS BANK INTERNATIONAL & CLS SERVICES LTD).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 43 :	Filed : 7/27/2012, Entry of Appearance for Mark A. Perry who will be replacing Steven J. Glassman as principal attorney on behalf of the appellees, CLS Bank International, et al. SERVICE : by Mail on 7/24/2012 DOC : : CLS Bank 2011-1301 (7.24.12 EOA PERRY).PDF
Entry 40 :	Mailed : 7/18/2012, Notice of Rejection: The entry of appearance for Mark A. Perry, counsel on behalf of the appellees, CLS Bank International, et al., received on 07/18/2012, cannot be filed; only one attorney may serve as principal counsel. SERVICE : by Court on 7/18/2012
Entry 39 :	Filed : 7/18/2012, Entry of Appearance for Brian Buroker as counsel on behalf of the appellees, CLS Bank International, et al. SERVICE : by Mail on 7/18/2012 DOC : : CLS Bank 2011-1301 (7.18.12 EOA BUROKER).PDF
Entry 38 :	Filed : 7/18/2012, Entry of Appearance for Michael Murray as counsel on behalf of the appellees, CLS Bank International, et al.

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	SERVICE : by Mail on 7/18/2012 DOC : : CLS Bank 2011-1301 (7.18.12 EOA MURRAY).PDF
Entry 36 :	Received : 4/2/2012, Appellant Alice Corporation Pty. Ltd.'s response to Appellee CLS Bank International, et al.'s supplemental authority. (Sent to Panel) SERVICE : by Hand on 4/2/2012
Entry 35 :	Received : 3/29/2012, Appellee CLS Bank International's Citation of Supplemental Authority pursuant to 28(j). (sent to panel) SERVICE : by Mail on 3/28/2012
Entry 34 :	Entered : 1/13/2012, Submitted after ORAL ARGUMENT by Adam L. Perlman and Steven J. Glassman. Panel: Linn, Prost and O'Malley.
Entry 33 :	Received : 12/12/2011, Response to oral argument order from the appellant, Alice Corporation Pty. Ltd. stating that Adam L. Perlman will argue. SERVICE : by Mail on 12/12/2011
Entry 32 :	Received : 12/6/2011, Response to Oral Argument Order for the appellee, CLS Bank International, stating Steven J. Glassman will argue. SERVICE : by Mail on 11/30/2011

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 31 :	Entered : 11/21/2011, NOTICE OF CALENDARING issued. Panel: 1201L on January 13, 2012.
Entry 28 :	Filed : 9/9/2011, Notice of Correction with new set of Briefs for Plaintiff-Appellee CLS Bank International and Counter Claim Defendant Appellee CLS Services, Ltd. SERVICE : by Mail on 9/9/2011
Entry 24 :	Filed : 8/12/2011, Entry of Appearance for William A. Tanenbaum as counsel on behalf of the appellees, CLS Bank International, et al. SERVICE : by Mail on 8/12/2011 DOC : : CLS Bank 2011-1301 (8.12.11 EOA TANENBAUM).PDF
Entry 23 :	Filed : 6/24/2011, Entry of Appearance for Constantine L. Trela, Jr. as counsel on behalf of appellant, Alice Corporation Pty. Ltd. SERVICE : by Mail on 6/24/2011 DOC : : CLS Bank 2011-1301 (6.24.11 EOA TRELA).PDF
Entry 19 :	Filed : 4/29/2011, Certificate of Interest for appellees, CLS Bank International, et al. SERVICE : by Hand on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.29.11 COI CLS BANK).PDF

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 18 :	Filed : 4/29/2011, Docketing Statement for the plaintiff-appellee, CLS Bank International, et al. SERVICE : by Mail on 4/21/2011
Entry 17 :	Filed : 4/29/2011, Entry of Appearance for David O. Bickart as counsel on behalf of the plaintiff-appellee, CLS Bank International, et al. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.29.11 EOA BICKART).PDF
Entry 16 :	Filed : 4/29/2011, Entry of Appearance for Steven J. Elliott as counsel on behalf of the plaintiff-appellee, CLS Bank International, et al. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.29.11 EOA ELLIOTT).PDF
Entry 15 :	Filed : 4/29/2011, Entry of Appearance for Steven J. Glassman as principal attorney on behalf of the plaintiff-appellee, CLS Bank International, et al. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.29.11 EOA GLASSMAN).PDF
Entry 14 :	Mailed : 4/22/2011, Notice of Rejection: Entry of Appearance for

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	Stephen J. Elliott as counsel on behalf of the plaintiff-appellee, CLS Bank International, et al., received 04/21/2011, cannot be filed; no proof of service. SERVICE : by Court on 4/22/2011
Entry 13 :	Mailed : 4/22/2011, Notice of Rejection: Entry of Appearance for David O. Bickart as counsel on behalf of the plaintiff-appellee, CLS Bank International, et al., received 04/21/2011, cannot be filed; no proof of service. SERVICE : by Court on 4/22/2011
Entry 12 :	Mailed : 4/22/2011, Notice of Rejection: Docketing Statement for the plaintiff-appellee, CLS Bank International, et al., received 04/21/2011, cannot be filed; counsel has not entered an appearance. Corrected Statement due 05/06/2011. SERVICE : by Court on 4/22/2011
Entry 11 :	Mailed : 4/22/2011, Notice of Rejection: Certificate of Interest for plaintiff-appellee, CLS Bank International, et al., received 04/21/2011, cannot be filed; counsel has not entered an appearance, no proof of service. SERVICE : by Court on 4/22/2011

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
Entry 10 :	Mailed : 4/22/2011, Notice of Rejection: Entry of appearance for Steven J. Glassman as principal attorney on behalf of the plaintiff-appellee, CLS Bank International et al., received 04/21/2011, cannot be filed; no proof of service. SERVICE : by Court on 4/22/2011
Entry 9 :	Filed : 4/21/2011, Docketing Statement for appellant, Alice Corporation Pty Ltd. SERVICE : by Mail on 4/21/2011
Entry 8 :	Filed : 4/21/2011, Certificate of Interest for appellant, Alice Corporation Pty Ltd. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.21.11 COI ALICE CORPORATION).PDF
Entry 7 :	Filed : 4/21/2011, Entry of Appearance for David M. Krinsky as counsel on behalf of appellant, Alice Corporation Pty. Ltd. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.21.11 EOA KRINSKY).PDF
Entry 6 :	Filed : 4/21/2011, Entry of Appearance

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	for Stanley E. Fisher as counsel on behalf of appellant, Alice Corporation Pty. Ltd. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.21.11 EOA FISHER).PDF
Entry 5 :	Filed : 4/21/2011, Entry of Appearance for Bruce R. Genderson as counsel on behalf of appellant, Alice Corporation Pty. Ltd. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.21.11 EOA GENDERSON).PDF
Entry 4 :	Filed : 4/21/2011, Entry of Appearance for Adam L. Perlman as counsel on behalf of appellant, Alice Corporation Pty. Ltd. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.21.11 EOA PERLMAN).PDF
Entry 3 :	Filed : 4/21/2011, Entry of Appearance for Ryan T. Scarborough as counsel on behalf of appellant, Alice Corporation Pty. Ltd. SERVICE : by Mail on 4/21/2011 DOC : : CLS Bank 2011-1301 (4.21.11 EOA SCARBOROUGH).PDF
Entry 2 :	Filed : 4/7/2011, Official Caption.

ENTRY	ENTRIES FOR CASE NUMBER: 2011-1301
	SERVICE : by Court on 4/7/2011
	DOC : : CLS Bank 2011-1301 (4.8.11 CAPTION).pdf
Entry 143 :	Filed : 12/1/212, Entry of Appearance for Mark R. Freeman as principal counsel on behalf of Amicus Curiae United States of America
	SERVICE : by Mail on 11/29/2012
	DOC : : CLS Bank 2011-1301 (12.11.12 EOA FREEMAN).PDF

DATE	BRIEFS
1/25/2013	Reply En Banc Brief for CLS Bank International and CLS Services Ltd. . BY CLS Bank International and CLS Services Ltd. (Appellee). SERVED BY Mail ON 1/25/2013. FILED ON 1/25/2013 . (NON-CONFIDENTIAL)
1/17/2013	Brief of Amicus Curiae The American Intellectual Property Law Association in support of Alice Corporation, Pty. Ltd. . BY American Intellectual Property Law Association (Amicus). SERVED BY Mail ON 1/17/2013. FILED ON 1/17/2013 . (NON-CONFIDENTIAL)
1/17/2013	Brief of Amici Curiae BGC Partners, inc. and Cantor Fitzgerald, LP on rehearing en banc in support of Defendant-Appellant Alice Corporation PTY, LTD. . BY BGC Partners, Inc., et al. (Amici). SERVED BY Mail ON 1/17/2013. FILED ON 1/17/2013 . (NON-CONFIDENTIAL)
1/17/2013	Brief of Bancorp Services, LLC as Amicus Curiae on Rehearing En Banc in Support of Alice Corporation . BY Bancorp Services, L.L.C. (Amicus). SERVED BY Mail ON 1/17/2013. FILED ON 1/17/2013 . (NON-CONFIDENTIAL)

DATE	BRIEFS
1/17/2013	Corrected Brief of Amicus Curiae Trading Technologies International, Inc. on Rehearing En Banc in Support of Defendant-Appellant Alice Corporation PTY, Ltd. . BY Trading Technologies International, Inc. (Amicus). SERVED BY Mail ON 1/31/2013. FILED ON 1/17/2013 . (NON-CONFIDENTIAL)
1/16/2013	Brief or Amicus Curiae Telecommunication Systems, Inc. and Bakul Banerjee, Ph.D. Supporting Defendant-Appellant Alice Corporation Pty. Ltd. . BY Telecommunication Systems, Inc., et al. (Amici). SERVED BY Mail ON 1/16/2013. FILED ON 1/16/2013 . (NON-CONFIDENTIAL)
1/16/2013	Brief of Amicus Curiae Dale R. Cook, Pro Se, On Rehearing En Banc in Support of Respondent . BY Dale R. Cook (Amicus). SERVED BY Mail ON 1/16/2013. FILED ON 1/16/2013 . (NON-CONFIDENTIAL)
1/16/2013	Brief of Amicus Curiae University of New Hampshire School of Law Intellectual Property Amicus Brief Clinic On En Banc Rehearing In Support of Appellant and Affirmance . BY University of New Hampshire School of Law (Amicus). SERVED BY Mail ON 1/16/2013. FILED ON 1/16/2013 . (NON-CONFIDENTIAL)

DATE	BRIEFS
1/10/2013	En Banc Response Brief of Defendant-Appellant Alice Corporation PTY. LTD. . BY Alice Corporation Pty. Ltd. (Appellant). SERVED BY Mail ON 1/10/2013. FILED ON 1/10/2013 . (NON-CONFIDENTIAL)
12/14/2012	Brief for The United States as Amicus Curiae on Rehearing En Banc in support of neither party . BY United States (Amicus). SERVED BY Mail ON 12/14/2012. FILED ON 12/14/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amici Curiae Electronic Frontier Fondation and Public Knowledge insupport of Appellees and Remand. . BY Electronic Frontier Foundation (Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amicus Curiae New York Intellectual Property Law Association in support of neither party. . BY New York Intellectual Property Law Association (Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amicus Curiae British Airways Plc, eHarmony, Inc., Intuit Inc., Linkedin Corp., SAP America, Inc., et al. . BY BRITISH AIRWAYS PLC, et al. (Amicus). SERVED BY

DATE	BRIEFS
	Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief Amicus Curiae of the Computer & Communications Industry Association . BY Computer & Communications Industry Association (Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amici Curiae Google Inc, et al. . BY Google Inc., et al. (Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amicus Curiae Intellectual Property Owners Association in Support of Neither party . BY Intellectual Property Owners Association (Amici). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amicus Curiae Conejo Valley Bar Association in Support of Neither Party . BY Conejo Valley Bar Association (Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amicus Curiae International Business Machines Corporation on Rehearing En Banc in support of neither party . BY International Business Machines Corporation

DATE	BRIEFS
	(Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief for BSA The Software Alliance as Amicus Curiae in support of Plaintiff-Appellee CLS Bank International . BY BSA The Software Alliance (Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/7/2012	Brief of Amici Curiae The Clearing House Association LLC and The Financial Services Roundtable in support of petitioners . BY The Clearing House Association L.L.C. (Amicus). SERVED BY Mail ON 12/7/2012. FILED ON 12/7/2012 . (NON-CONFIDENTIAL)
12/6/2012	Brief of Amicus Curiae Sigram Schindler Beteiligungsgesellschaft mbH, in support of neither party. . BY Sigram Schindler Beteiligungsgesellschaft mbH (Amicus). SERVED BY Mail ON 12/6/2012. FILED ON 12/6/2012 . (NON-CONFIDENTIAL)
12/4/2012	Brief of Amicus Curiae The Juhasz Law Firm, P.C. on En Banc Rehearing Supporting Neither Party . BY The Juhasz Law Firm (Amicus). SERVED BY Mail ON 12/4/2012.

DATE	BRIEFS
	FILED ON 12/4/2012 . (NON-CONFIDENTIAL)
12/4/2012	Brief of Amicus Curiae The Intellectual Property Law Association of Chicago Supporting Neither Affirmance nor Reversal. . BY The Intellectual Property Law Association of Chicago (Amicus). SERVED BY Mail ON 12/4/2012. FILED ON 12/4/2012 . (NON-CONFIDENTIAL)
11/30/2012	Corrected Brief of Lee Hollaar and Petere K. Trzyna as Amicus Curiae In support of neither party. . BY Lee Hollaar, et al. (Amicus). SERVED BY Mail ON 12/10/2012. FILED ON 11/30/2012 . (NON-CONFIDENTIAL)
11/30/2012	Amici Curiae Internet Retailers' Corrected Brief in Support of Neither Party . BY Internet Retailers (Amicus). SERVED BY Mail ON 12/11/2012. FILED ON 11/30/2012 . (NON-CONFIDENTIAL)
11/30/2012	Principal En Banc Brief for CLS Bank International and CLS Services Ltd. . BY CLS Bank International and CLS Services Ltd. (Appellees). SERVED BY Mail ON 11/30/2012. FILED ON 11/30/2012 . (NON-CONFIDENTIAL)

DATE	BRIEFS
11/29/2012	Brief of Koninklijke Philips Electronics NV as Amicus Curiae, Supporting Neither Party . BY Koninklijke Philips Electronics NV (Amicus). SERVED BY Mail ON 11/29/2012. FILED ON 11/29/2012 . (NON-CONFIDENTIAL)
11/1/2012	Brief of Amicus Curiae of Stephen R. Stites on En Banc Rehearing In Support of Affirmation of Judgment . BY STEPHEN R. STITES (Amicus). SERVED BY Mail ON 11/1/2012. FILED ON 11/1/2012 . (NON-CONFIDENTIAL)
9/23/2011	Joint Appendix . BY Alice Corporation Pty. Ltd. (Appellant). SERVED BY Mail ON 9/23/2011. FILED ON 9/23/2011 . (NON-CONFIDENTIAL)
9/16/2011	Reply Brief of Defendant-Appellant Alice Corporation PTY. Ltd. . BY Alice Corporation Pty. Ltd. (Appellant). SERVED BY Mail ON 9/16/2011. FILED ON 9/16/2011 . (NON-CONFIDENTIAL)
8/26/2011	Corrected Brief of Plaintiff-Appellee CLS Bank International and Counterclaim-Defendant Appellee CLS Services, Ltd. . BY CLS Bank International and CLS Services, Ltd. (Appellees). SERVED BY Mail ON 9/9/2011. FILED ON 8/26/2011 . (NON-CONFIDENTIAL)

DATE	BRIEFS
8/22/2011	REPLACED Corrected Brief of Plaintiff-AppelleesCLS Bank International and Counterclaim-Defendant Appellee CLS Services Ltd. . BY CLS Bank International and CLS Services Ltd. (Appellees). SERVED BY Mail ON 8/26/2011. FILED ON 8/22/2011 . (NON-CONFIDENTIAL)
6/24/2011	Brief of Defendant-Appellant Alice Corporation PTY. Ltd. . BY Alice Corporation Pty. Ltd. (Appellant). SERVED BY Mail ON 6/24/2011. FILED ON 6/24/2011 . (NON-CONFIDENTIAL)
10/26/2012	Brief of Amicus Curiae of Stephen R. Stites on En Banc Rehearing In Support of Affirmation of Judgment . BY Stephen R. Stites (Amicus). SERVED BY Mail ON 10/25/2012. REJECTED ON 10/26/2012 . (NON-CONFIDENTIAL)
12/3/2012	Brief of Professor Lee Hollaar and Peter K. Trzyna as Amicus Curiae in Support of Neither Party . BY Lee Hollaar, Peter K. Trzyna (Amicus). SERVED BY Mail ON 11/30/2012. REJECTED ON 12/3/2012 . (NON-CONFIDENTIAL)
12/11/2012	Amici Curiae Internet Retailers' Brief in Support of Neither Party. . BY Internet Retailers (Amicus).

DATE	BRIEFS
	SERVED BY Mail ON 11/30/2012. REJECTED ON 12/11/2012 . (NON-CONFIDENTIAL)
1/18/2013	Brief of Amicus Curiae Dale R. Cook, Pro Se, on Rehearing En Banc in support of Respondent . BY Dale R. Cook (Amicus). SERVED BY Mail ON 1/16/2013. REJECTED ON 1/18/2013 . (NON-CONFIDENTIAL)
1/18/2013	Brief of Amicus Curiae University of New Hampshire School of Law Intellectual Property Amicus Brief Clinic on en banc rehearing in suppor tof appellant and affirmance. . BY University of New Hampshire School of Law (Amicus). SERVED BY Mail ON 1/16/2013. REJECTED ON 1/18/2013 . (NON-CONFIDENTIAL)
1/18/2013	Brief of Bancorp Services, LLC as Amicus Curiae on rehearing en banc in support of Alice Corporation. . BY Bancorp Services, LLC. (Amicus). SERVED BY Mail ON 1/17/2013. REJECTED ON 1/18/2013 . (NON-CONFIDENTIAL)
1/23/2013	Brief of Amius Curiae Trading Technologies International, inc on Rehearing En Banc In support of Defendant-Appellant Alice Corporation PTY, LTD. . BY Trading Technologies International, Inc.

DATE	BRIEFS
	(Amicus). SERVED BY Mail ON 1/17/2013. REJECTED ON 1/23/2013 . (NON-CONFIDENTIAL)
8/24/2011	Brief of Plaintiff-Appellee CLS Bank International and Counterclaim-Defendant Appellee CLS Services Ltd. . BY CLS Bank International and CLS Services Ltd. (Appellee). SERVED BY Mail ON 8/22/2011. REJECTED ON 8/24/2011 . (NON-CONFIDENTIAL)

DATE	REHEARING
8/22/2012	Entry 47 : Appellees [CLS Bank International and CLS Services Ltd.]-Petition for Rehearing En Banc. Mail Service-8/22/2012. Filed: 8/22/2012. Response requested from: Appellant (Alice Corporation Pty. Ltd.). Response due: 9/20/2012. Response filed: 9/20/2012 Entry 65: Petition/En Banc Action: Denied/Granted on 10/9/2012.

IN THE UNITED STATES DISTRICT COURT FOR
THE DISTRICT OF COLUMBIA

Case No. 07-CV-00974-RMC

CLS BANK INTERNATIONAL,

Plaintiff,

v.

ALICE CORPORATION PTY. LTD.,

Defendant.

ALICE CORPORATION PTY. LTD.,

Counterclaim-Plaintiff,

v.

CLS BANK INTERNATIONAL,

Counterclaim-Defendant,

and

CLS SERVICES LTD.,

Counterclaim-Defendant.

DECLARATION OF JAMES HUGHES IN SUPPORT OF PLAINTIFF AND COUNTERCLAIM-DEFENDANTS' MOTION TO DISMISS OR, ALTERNATIVELY, FOR SUMMARY JUDGMENT

I, James Hughes, declare as follows based on my personal knowledge:

1. I am the Director of Business Risk Analysis for counterclaim-defendant CLS

Services Ltd. ("CLS Services U.K."), which contracts with plaintiff/counterclaim-defendant CLS Bank International ("CLS Bank") to provide certain services as described below. My business address is I Harbour Exchange Square, London El 4 90E, United Kingdom.

2. I joined CLS Services U.K. in 1997. I have worked on the development and management of foreign exchange transaction settlement systems since 1993, and on transaction settlement systems in general since 1983. I have an M.B.A. (Accounting) from the University of Wisconsin at Madison, and a B.A (Economics/Political Science) from the same institution.

3. In my current position, I oversee the daily activities of CLS Bank and CLS Services U.K. from a risk management perspective, and develop risk management policies in connection with those activities. In the past I helped to develop functional specifications for the settlement operations of CLS Bank and CLS Services U.K., and I am familiar with those operations.

4. I make this declaration in support of CLS Bank's and CLS Services U.K.'s Motion to Dismiss or, Alternatively, for Summary Judgment (the "CLS Motion").

CLS Bank International

5. CLS Bank, with its principal office in New York, New York, is an "Edge Act Corporation," organized under Section 25A of the Federal Reserve Act, as amended. CLS Bank is authorized by statute to engage in international banking activities.

6. CLS Bank is a subsidiary of CLS U.K. Intermediate Holdings Ltd. ("CLS U.K. Holdings"), a

private limited company incorporated under the laws of England and Wales, which is in turn a wholly-owned subsidiary of CLS Group Holdings AG ("CLS Group Holdings"), a company incorporated under the laws of Switzerland, with its registered office in Zurich.

7. CLS Services U.K., a private limited company organized under the laws of England and Wales with offices in the U.K., is a subsidiary of CLS U.K. Holdings.

8. CLS Bank has a master services agreement with CLS Services U.K., pursuant to which CLS Services U.K. provides CLS Bank with far-ranging system and operational support, including data processing systems and services, and administrative support.

Overview of the CLS Service and the CLS Core System

9. CLS Bank provides, in conjunction with CLS Services U.K., a "continuous linked settlement" service (the "CLS Service") for the settlement of payment instructions ("Instructions") related to underlying foreign exchange ("FX") transactions. The CLS Service protects against certain risks associated with FX transactions by providing for the continuous and simultaneous settlement of payments from different parties in fifteen different currencies (e.g., U.S. dollar, British pound, Euro, Swiss franc, etc.).

10. CLS Bank provides the CLS Service to banks known as CLS Bank Settlement Members ("Members"). Through the CLS Bank Members, the CLS Service is provided to other third parties (including banks) worldwide.

11. Members maintain multicurrency accounts with CLS Bank ("Member

Accounts"). CLS Bank itself maintains an account with the Central Bank responsible for each of the currencies for which CLS Bank provides settlement services (e.g., the Federal Reserve, the Bank of England, etc.) (each a "CLS Central Bank Account"). Members make periodic pay-ins to the CLS Central Bank Account corresponding to a particular currency; the pay-ins are then reflected in the balance of the Member Account maintained by CLS Bank.

12. The CLS Service is implemented in computer hardware and software (the "CLS core system") located in the United Kingdom ("U.K."). The CLS core system maintains Member Accounts, processes payments by Members into their Member Accounts, receives and processes Instructions, carries out the steps in the settlement process, and issues instructions to effect pay-outs to Members of balances in their Member Accounts.

13. The CLS Service allows CLS Bank (through its arrangement with CLS Services U.K.) to settle the two payments relating to an FX transaction by having the CLS core system in the U.K. simultaneously credit and debit the corresponding Member Accounts. By debiting and crediting the Member Accounts simultaneously on the CLS core system, the CLS Service eliminates the risk that one payment could be made and the corresponding payment not received.

14. For example, suppose Bank A has agreed with Bank B (both CLS Members) to exchange $100 million for £50 million. Each Bank has a multicurrency Member Account with CLS Bank that is maintained on the CLS core system in the U.K. By settling this transaction using the CLS Service, Bank A's Member Account is debited $I00 million and credited £50 million, while, simultaneously, Bank B's Account is

credited $100 million and debited £50 million. Using the CLS Service, Bank B can ensure its does not pay out $I00 million without receiving the corresponding payment from Bank A for £50 million, and vice versa.

The CLS Service Is Effectuated By The CLS Core System

15. Members of CLS Bank electronically submit, to CLS Services U.K., Instructions for settlement on a particular date (the "settlement date"). Instructions may be submitted by a Member, relating to its own underlying FX transactions, or on behalf of the Member's third party customers who use the Member to settle Instructions relating to the customer's underlying FX transactions.

16. Members submit Instructions for settlement processing by using specific electronic messages. Each Instruction must identify: (i) the Member submitting the Instruction and the other Member that is expected to submit an Instruction with respect to the same FX transaction; (ii) the exchange rate and amounts and identities of currencies to be delivered and received pursuant to the Instructions; (iii) the date on which the Instruction is scheduled for settlement in CLS Bank; and (iv) the two parties to the underlying FX transaction.

17. Instructions relating to the same FX transaction are received, authenticated and matched by the CLS core system. The matched ("paired") Instructions are then stored on the CLS core system until the settlement date.

18. On the settlement date, each Member makes one or more pay-ins to its Member Account, in a total amount sufficient to cover the settlement of all Instructions submitted by the Member for that

settlement date. Members make pay-ins based on a pay-in schedule prepared by, and transmitted to the Member by, the CLS core system.

19. On the settlement date, each paired Instruction to be settled is placed in a "settlement queue" that is maintained on the CLS core system. The CLS core system then tests each paired Instruction in the settlement queue to determine if settlement would cause the balance of either of the corresponding Member Accounts to fall below certain predetermined values, or to exceed certain limits (the "risk management tests").

20. If it fails the risk management tests, the paired Instruction remains on the settlement queue for later reevaluation.

21. If it passes the risk management tests, the paired Instruction is settled when the CLS core system simultaneously debits and credits the Member Accounts of two Members in accordance with the paired Instruction.

22. Periodically throughout the settlement day, CLS Bank pays out to each Member any positive balance in that Member's multicurrency Member Account. To do so, the CLS core system issues an instruction, on behalf of CLS Bank, to the relevant Central Bank to make a payment to the Member (or its designated agent) by debiting the CLS Central Bank Account held by that Central Bank.

The CLS Core System is Located in the U.K.

23. The CLS core system is comprised of IBM pSeries computers, coupled to Enterprise Storage Server Model SO() storage devices. These computers and data storage devices are physically located in two

"IBM Data Centers" in the U.K. The two IBM Data Centers contain identical redundant systems, each of which can process the full volume of CLS FX transaction traffic. The IBM Data centers arc maintained by IBM U.K. Ltd. ("IBM") pursuant to an agreement with CLS Bank,

24. The CLS core system computers and coupled data storage devices located in the IBM Data Centers in the U.K. carry out each of the tasks described above, including: receiving and processing pay-ins from Members; storing and adjusting Member Accounts; receiving and storing electronic Instructions from Members; authenticating, validating, processing, filtering and matching Instructions; building a settlement processing queue; testing Instructions to determine if the risk management tests are met before settlement; settling paired Instructions that pass the risk management tests by simultaneously debiting and crediting the relevant Member Accounts to reflect the Instructions; and issuing pay-out instructions to Central Banks. CLS's Limited Facilities In The United States

25. CLS Bank uses several facilities in the United States that are maintained by CLS Bank, IBM, or AT&T. However, none of these facilities contain CLS core system computers or coupled data storage devices, and none can be used to settle Instructions. in addition, none of these facilities can serve as a backup for the CLS core system.

26. The following facilities are located in the United States:

(a) A facility maintained by IBM, known as an "IBM Command Center." This facility contains IBM computers that are used to review (remotely) performance metrics relating to the CLS core system computers and data storage devices located in the IBM Data Centers in the U.K. The IBM Command Center in the U.S. can diagnose problems with the CLS core system, and start and stop the CLS core system if necessary. It cannot he used to settle instructions, or serve as a backup for the CLS core system or the IBM Data Centers.[1]

(b) A facility maintained by CLS Bank, known as an "Operations Center." This facility allows administrative oversight of the CLS Service by permitting operators to review (remotely) information relating to the Instructions processed by the CLS core system in the U.K. The Operations Center in the U.S. cannot be used to settle Instructions, and cannot serve as a backup for the CLS core system or the IBM Data Centers.[2]

(c) Two facilities maintained by AT&T, known as "RTGS Crossover sites." These facilities contain routing and encryption/decryption devices used to connect (I) the AT&T network that links the CLS core system and other CLS facilities with (2) the "Fedwire" network (operated by Sprint and the United States Federal Reserve) that is used by banks and other institutions to communicate with Federal Reserve Banks. The RTGS Crossover sites cannot be used to settle Instructions, and cannot serve as backups for the CLS core system or the IBM Data Centers.

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[1] There is also an IBM Command Center in the U.K.

[2] There are also two Operations Centers in the U.K., one of which also serves as a Business Continuity Office (see ¶ 26(d)).

(d) A facility maintained by CLS Bank, known as a "Business Continuity Office." This facility contains computers and other equipment used to provide email and business services, such as accounting services, to the CLS Group. The Business Continuity Office in the U.S. cannot be used to settle Instructions, and cannot serve as a backup for the CLS core system or the IBM Data Centers.

The Allegedly Infringing Service Is Not Carried Out in the United States, and No Part of the Allegedly Infringing System Is Located in the United States

27. I understand that the Alice Corporation Pty. Ltd. alleges in this lawsuit that CLS Bank infringes U.S. Patent No. 5,970,479 (the "'479 patent") which contains certain "method" claims; U.S. Patent No. 6,912,5I0 (the "'510 patent") also containing certain "method" claims; and U.S. Patent No. 7,I49,720 (the "'720 patent") containing certain "system" claims. I understand that the following arc, facially, the broadest claims of each of these patents:

28. Claim 33 of the '479 patent:

> 33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

(a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;

(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;

(c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and

(d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

29. Claim 68 of the '510 patent:

68. A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution, the method performed by the supervisory institution, comprising:

maintaining a first account for a first party, independent from a second account maintained by a first exchange institution;

maintaining a third account for a second party, independent from a fourth account maintained by a second exchange institution;

electronically adjusting said first account and said third account in order to effect the exchange obligation between said first party and said second party after ensuring that said first party and said second party have adequate value in said first account and said third account, respectively; and

providing an instruction to said first exchange institution and said second exchange institution to adjust said second account and said fourth account in accordance with the adjustment of said first account and said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and said second exchange institution.

30. Claim 68 of the '720 patent:

68. A data processing system to enable the exchange of an obligation between parties, the system comprising:

a data storage unit having stored therein (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

a computer, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and (c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

31. Without in any way opining on or conceding the breadth or scope of the claims of the '479 patent or '510 patent, I will assume, solely for purposes of the CLS Motion, that the claims of these patents may be interpreted to encompass a method comprising (I) maintaining accounts for two parties to a transaction, (2) adjusting the parties' accounts in accordance with the terms of the transaction, after testing the transaction to ensure that the parties have adequate

value in their accounts, and (3) providing instructions to another institution (e.g., a bank) to adjust accounts maintained at that institution.[3]

32. The only process used by or on behalf of CLS Bank or CLS Services U.K. that involves (I) maintaining accounts for two parties to a transaction, (2) adjusting the accounts to reflect the transaction, after testing the transaction to ensure that the account balances are adequate, and (3) providing instructions to another bank, is performed entirely in the U.K., utilizing the CLS core system computers and coupled data storage units at the IBM Data Centers located in the U.K., as discussed above.

33. Without, in any way, opining on or conceding the breadth or scope of the claims of the '720 patent, I will assume, solely for purposes of the CLS Motion, that: the claims of this patent may be interpreted to encompass a computer system and coupled storage devices configured to (I) maintain accounts for two parties to a transaction, (2) adjust the parties' accounts in accordance with the terms of the transaction, after testing the transaction to ensure that the parties have adequate value in their accounts, and (3) provide instructions to another institution to adjust accounts maintained at that institution.[4]

34. The only computer system (including coupled storage devices) operated by cc on behalf of CLS Bank and/or CLS Services U.K. that is configured to (I) maintain accounts for two parties to a transaction, (2)

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[3] I understand that if this case were to proceed beyond a decision on the CLS Motion, CIS Bank and CLS Services U.K. would contend, among other things, that Alice's claims must be more narrowly construed.

[4] *See* note 3.

adjust the accounts to reflect the transaction, after testing the transaction to ensure that the account balances arc adequate, and (3) provide instructions to another bank, is located entirely in the U.K., utilizing the CLS core system computers and coupled data storage units at the IBM Data Centers located in the U.K., as discussed above.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on September 12, 2007.

/s/ James Hughes

James Hughes

IN THE UNITED STATES DISTRICT COURTFOR THE DISTRICT OF COLUMBIA

Case No. 07-CV-00974-RMC

CLS BANK INTERNATIONAL,

Plaintiff,

v.

ALICE CORPORATION PTY. LTD.,

Defendant.

ALICE CORPORATION PTY. LTD.,

Counterclaim-Plaintiff,

v.

CLS BANK INTERNATIONAL,

Counterclaim-Defendant,

and

CLS SERVICES LTD.,

Counterclaim-Defendant.

EXPERT DECLARATION OF PAUL GINSBERG

I. Background and Incorporation of Expert Report

1. My name is Paul Ginsberg. I am an independent business process consultant serving the financial services sector.

2. I hereby adopt as part of this declaration, and incorporate by reference, my Expert Report of December 12, 2008, attached as Exhibit 87 to Alice Corporation Pty. Ltd.'s

Memorandum in Support of Its Opposition to CLS's Motion for Summary Judgment of No Infringement Within the United States and Cross-Motion for Partial Summary Judgment, also filed today. A summary of my education and experience is set forth therein.

II. Requested Opinions

3. In addition to the matters discussed in my Expert Report, I have been asked for my opinion about the meaning of certain elements of claims 33 and 34 of U.S. Patent No. 5,970,479 ("the '479 patent"), and all claims of U.S. Patent Nos. 6,912,510 ("the '510 patent"), and 7,149,720 ("the '720 patent") . For purposes of this Declaration, I will refer to these claims as the "Asserted Claims," and the three patents as the "Asserted Patents" or "Shepherd Patents."

4. In particular, I have been asked for my opinion as to scope of the Asserted Claims of the '720 patent, including the nature of the "data processing system," "computer" and "data storage unit" recited in those claims. In addition, I have been asked for my opinion as to scope of the Asserted Claims of the '510 patent and claims 33 and 34 of '479 patents, including whether any or all steps of methods recited therein must be implemented "electronically" using a "computer" system. With this in mind, I have reviewed all three Asserted Patents, as well as their prosecution histories.

5. I have also been asked to provide background testimony as to the settlement of obligations, such as the foreign currency exchanges that I understand to be at issue in this litigation.

III. Person of Ordinary Skill in the Art

6. In my opinion, the person of ordinary skill in the art to which the Asserted Patents are directed is a person with experience in banking operations and systems, including at least five years experience in the financial services industry with knowledge of and experience in large value trading, settlement, and payment computer systems and methods. This could, for example, be a person with a financial business background who has specified technology requirements for payment systems or other financial systems. Alternatively, it could be an individual experienced in financial computer systems who has worked with operations and business people to build systems to meet various banking needs.

IV. Background on the Exchange of Obligations

7. When obligations arise from a trade made between two parties, e.g., a trade of stock or a trade of foreign currency, typically, there is a gap in time between when the obligation arises and when the trade is "settled" and the exchange is performed. In a number of financial contexts, the process of exchanging obligations, or settlement, is separate from the process of entering into a contract to perform a trade.

8. For example, if Bank of America wishes to exchange 10,000,000 U.S. dollars for euros, it might enter into a binding obligation (mediated through what are usually known as the foreign exchange markets) to sell those dollars to Deutsche Bank in exchange for 7,500,000 euros. Typically, it would not be obligated to give Deutsche Bank the dollars, nor would Deutsche Bank be obligated to give them the euros, until two days after the price is set and the agreement is entered. After two days, the parties will "settle" the trade—that is, Bank of America will pay its dollars to Deutsche Bank, and Deutsche Bank will pay its euros to Bank of America.

9. A simple way for Deutsche Bank and Bank of America to settle their trade would be for Deutsche Bank to wire Bank of America 7,500,000 euros, and for Bank of America to wire Deutsche Bank 10,000,000 dollars. However, this approach has a risk: if Bank of America wires the dollars, but Deutsche Bank fails to wire the euros, Bank of America will have lost its 10,000,000 dollars. If, for example, Deutsche Bank has gone bankrupt and/or is shut down by regulators, the loss may be permanent. The risk that only one side, or "leg," of a trade will be fulfilled during the process of settlement is known as "settlement" risk.

V. Background on the Patented Inventions

A. Eliminating Settlement Risk

10. The Shepherd patents are all generally directed to methods or systems that help lessen settlement risk using a computer system. Generally speaking, a trusted intermediary might operate a computer system that exchanges the parties' obligations, and by performing the particular electronic method can lessen settlement risk.

11. To continue the example above, Bank of America sends its dollars to the intermediary, and its account information on the intermediary's computer system is updated to reflect this credit. Deutsche Bank, similarly, sends its euros. After both parties have "paid in" their funds, the computer adjusts each party's account. Bank of America's account is irrevocably adjusted to reflect a $10,000,000 debit and a €7,500,000 credit; Deutsche Bank's account is irrevocably adjusted to reflect a €7,500,000 debit and a $10,000,000 credit. As long as the parties trust the intermediary (based on, for example, a contractual relationship or a regulatory status), their settlement risk is eliminated; at worst, if Deutsche Bank fails to pay in, Bank of America will simply recover its $10,000,000 from the intermediary.

B. The Patents

12. The Asserted Patents share, with minor differences, a common specification. This

specification discloses a complex computer-based system and various electronic methods for formulating risk management contracts, trading the contracts, and exchanging the resulting obligations. *E.g.*, '510 patent, col. 3, ll. 39-48 ("The invention encompasses methods and apparatus enabling the management of risk relating to specified, yet unknown, future events by enabling entities (parties) to reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent on the occurrence of the specified future events. The entities submit such orders to a 'system' which seeks to price and match the most appropriate counter-party, whereupon matched contracts are appropriately processed through to their maturity."); *see also* '479 patent, col. 3, ll. 29-39 (same); '720 patent, col. 3, 46-55 (same). "The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices." '510 patent col. 31, l. 66—col. 32, l. 3; '720 patent, col. 32, 29-33 (same); '479 patent, col. 28, ll. 13-15 (same).

13. The systems and methods for exchanging an obligation, which I described above, reflect one aspect of this broader system. See, e.g., '510 patent col. 5. ll. 21-23 ("The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement."); '720 patent, col. 5, ll. 60-62 (same); '479 patent, col. 5 ll. 61-64 (same);

see also '510 patent col. 36, 11. 33-46 ("CONTRACT APPS is a term used to refer to certain types of units of applications software. . . . The purpose of individual CONTRACT APPS is two-fold: *First*, to effect the trading/exchange/ transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others. . . . And *second*, to appropriately manage all matched/ confirmed contracts through to their time of maturity, *including their ultimate settlement*." (emphasis added); '720 patent, col. 37, 11. 30-44 (same); '479 patent, col. 32, 1. 61—col. 33, 1. 7 (same).

14. The claims of the '510 and '720 patents are primarily directed towards methods and systems, respectively, for this latter "exchanging an obligation" aspect of the invention as is apparent from the title of the '510 patent, "Methods of Exchanging an Obligation," and the title of the '720 patent, "Systems for Exchanging an Obligation." The claims of both of these patents are directed to computer methods and systems, respectively, for exchanging an obligation. The '479 patent also claims computer systems and methods that perform a wider variety of operations. A person of ordinary skill in the art would understand, as I do, that claims 33 and 34 of the '479 patent are directed to methods for exchanging an obligation using a computer system.

VI. '479 Patent—Opinions Concerning Scope of the Claims

15. As noted, claims 33 and 34 of the '479 patent recite methods by which obligations are exchanged.

16. A person of ordinary skill in the art, reviewing the claims in view of the patent specification (including the description of the subject matter in þþ 12-14 above) and the prosecution history, would under-stand that the method is to be performed on a computer and storage device configured to perform certain tasks. As the patent explains, the invention involves novel systems and methods in the field of data processing technology. '479 patent, col. 28, 11. 13-15 ("The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices."). The entire patent is directed to computer systems and the software applications, e.g., "CONTRACT APPS," needed to perform the methods described in the patent. '479 patent, col. 32, 1. 61—col. 33, 1. 7 ("CONTRACT APPS is a term used to refer to certain types of units of applications software. . . . The purpose of individual CONTRACT APPS is two-fold: *First*, to effect the trading/exchange/transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others. . . . And *second*, to

appropriately manage all matched/confirmed contracts through to their time of maturity, *including their ultimate settlement.*" (emphasis added); see also '479 patent col. 42, 11. 8-12 ("In their manifestation as telecommunications/computer software residing on telecommunications/computer hardware, individual CONTRACT APPS consist of a cluster of processes, utilizing a number of data files, residing on one or more processing units."). Figure 2 of the specification depicts such a computer system and Figure 25 depicts a method step within the scope of the claims utilizing a computer system.

17. Specific terms in the claims 33 and 34, when read in light of the specification, would be understood by the person of ordinary skill in the art to require that the methods recited in those claims are electronically implemented by a computer. These include, for example, "shadow credit record," "shadow debit record," and "transaction." While I am not construing these claim terms for all purposes, a person of ordinary skill in the art would unquestionably understand the terms "shadow credit record" and "shadow debit record" to require the electronic storage of data files in a data storage unit. '479 patent, col. 24, 1. 65—col. 25, 1. 2 ("The process effects these payment/receipts in a two-stage process. First, by debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts."). "[D]ata file PAYACC SHADOW" is a reference to

data files in data storage unit. And this is simply an example. There are many other references throughout this specification from which the person of ordinary skill in the art would understand, as I do, that claims 33 and 34 of the '479 patent are limited to electronically implemented methods

18. I understand from reviewing the prosecution history that led to the issuance of the '510 patent that the examiner, at one point, see CLS Ex. 4, Office Action, at 3 (Sep. 3, 2003), suggests that the claims then being prosecuted—years after the '479 patent issued—and given their broadest possible construction as I am told is required under PTO regulations, would not necessarily be limited to an electronic implementation of the methods described without an express recitation of the term "electronically" in the claim. However, a person of ordinary skill in the art reviewing the 100-plus page specification of the '479 patent—then and today—would have understood that the methods recited in claims 33 and 34 of the '479 patent would be limited to electronic implementation using a computing device for the reasons discussed herein. While there are variations of the embodiments described in the patents that may be encompassed by claims 33 and 34, a person of ordinary skill in the art, reading the patent and prosecution history, would conclude that these claims only cover electronically implemented methods of exchanging obligations.

VII. '510 Patent — Opinions Concerning Scope of the Claims

19. The '510 patent also claims methods by which obligations are electronically exchanged so as to eliminate settlement risk.

20. Using claim 68 as an example, the method has four steps: (1) "maintaining a first account" for one party, independent from a second account maintained by an exchange institution; (2) "maintaining a third account" for a second party, also independent from a fourth account maintained by an exchange institution; (3) "electronically adjusting" the first and third accounts "in order to effect the exchange obligation" between the parties; and (4) providing an instruction "being an irrevocable, time invariant obligation" to the exchange institutions in accordance with the adjustment.

21. "Electronically adjusting" an "account" (or, in some claims, a "record") is a key feature of the method. The adjustment of accounts begins the process of effecting the exchange of obligations that is the method's stated purpose. *E.g.*, '510 patent, col. 28, 11. 50-58 ("The process effects these payment/receipts in a two-stage process. First, by debiting/ crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts."). It is not possible to "electronically adjust" an account without some sort of electronic device. *E.g.*, '510 patent col. 31, 1. 66—col. 32 ("The apparatus

and methods described allow the management of risk in an automated manner by means of programming of the computing devices.").

22. The electronic adjustment of an account necessarily results in some kind of physical, electronic change in the medium in which the data to be adjusted are stored. For example, if (as would be typical, *see, e.g.*, '510 patent col. 7, ll. 17-20) (discussing Sun Microsystems "mass storage units"), the account information is stored on a hard disk drive within a data storage unit, adjusting the account will result in the ferromagnetic material located at particular areas on the hard drive—corresponding to the binary bits of the data—being magnetized or demagnetized.

23. Moreover, a person of ordinary skill in the art would appreciate that if the accounts are to be adjusted electronically, they will also be maintained electronically. As disclosed in the patent, the computer system would be capable of both maintaining accounts and adjusting them. Thus, at least three of the four steps of the method in claim 68 of the '510 patent are performed using an electronic computer.

24. Looking at the claims and their terms, a person of ordinary skill in the art would understand, for much the same reasons as in the '479 patent, that—regardless of the precise scope of the claims—the '510 patent recites a method to be performed on a computer, as opposed to a method that can

performed offline using a pencil and paper or in some other manner without a computer.

25. In an abstract sense, it is possible to perform the business methods of maintaining accounts, adjusting accounts, and providing an instruction without a computer or other hardware. If someone had thought of this invention 100 years ago, they might have implemented it in a non-electronic manner using various pre-computing tools such as an abacus or handwritten ledgers.

26. However, when the plain language of the methods claimed in the '510 patent are construed in light of the specification of which they are a part and in view of the prosecution history and other knowledge inherent in one skilled in the art, a person of skill in the art would conclude that the claimed methods must be implemented electronically using some type of computing processor and memory.

27. As mentioned above, it is clear that "[t]he apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices." '510 patent col. 31, 1. 67—col. 32, 1.3. Put simply, the processes described in the patents—including the settlement process—are electronically implemented by way of a processor and memory. *See, e.g.*, '510 patent col. 45, 11. 46-67 ("In their manifestation as telecommunications/computer software residing on telecommunications/computer hardware, individual CONTRACT APPS

consist of a cluster of processes, utilizing a number of data files, residing on one or more processing units.").

VIII. '720 Patent—Opinions Concerning Scope of the Claims

28. The '720 patent claims a "data processing system" comprising a "data storage unit" and a "computer." *E.g.*, '720 patent claim 68.

29. The "data storage unit" is a specific component, such as a disk drive or file server, that can store data. An example of a "data storage unit" disclosed in the specification is a "mass storage unit[] ... commercially available from Sun Microsystems," such as is disclosed at col. 7, 11. 53-55 of the '720 patent. The data storage unit "ha[s] stored therein" information about at least two "account[s]" or "record[s]."

30. The "computer" is also a specific component, comprising one or more "data processors . . . such as the Sun 670 MP manufactured by Sun Microsystems." '720 patent, col. 7, 11. 36-37. The computer is "coupled to" the data storage unit and is configured, using software, to manipulate data that is "stored" on the data storage unit. Id. The computer is also "configured to" perform steps of a method that is similar to (though not identical with) the methods of the '479 and '510 patents. This method has the effect of exchanging an obligation while eliminating settlement risk. The term "computer" would be understood by the person of ordinary skill in the art to refer to either one or more

processors in a single unit or multiple processors in a distributed computer system involving multiple units at one or more sites, such as the "computer system" depicted in Figure 2a and discussed at col. 7, 11. 31-49 of the '720 patent.

31. The "adjusting" step that the computer is configured to perform, like the "adjusting" step of the methods claimed in the '510 patent, is to be performed "electronically."

32. "Computer" and "data storage unit" therefore clearly refer to specific computer system hardware that has been configured with software to perform a specific set of functions.

33. The steps that the claimed system is configured to perform are, of course, intended to be performed by the computer. The claims of the '720 patent are directed only to the computer configured to perform them. Moreover, the claim recites that they are to be performed "electronically," and the remaining claim terms also are phrased in a way that, read in light of the specification, limits their performance to a computer (for the same reasons as for the analogous terms in the '479 and '510 patents). However, the basic settlement operations could be performed without the aid of a computer if they were not so claimed.

34. Indeed, one could, in principle, mitigate settlement risk by having two counterparties pay funds into accounts maintained with a trusted intermediary, then adjust the accounts at that intermediary and pay out funds corresponding to the settled obligation, even without the trusted intermediary carrying out the steps using a computer. One could also, in principle, use non-electronic computing equipment in this process—for example, if the account adjustments were facilitated by a mechanical adding machine or an abacus. If one were to do this, however, none of the Asserted Patents would be infringed, as a person of ordinary skill in the art would understand them to be limited to an electronic computer implementation.

35. To summarize, the claims of the '720 patent are directed to a data processing system, having particular components, that is configured to electronically exchange obligations.

* * *

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 3 April 2009.

/s/ Paul Ginsberg

Paul Ginsberg

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

Case No. 07-CV-00974-RMC

CLS BANK INTERNATIONAL,
Plaintiff,
v.
ALICE CORPORATION PTY. LTD.,
Defendant.

ALICE CORPORATION PTY. LTD.,
Counterclaim-Plaintiff,
v.
CLS BANK INTERNATIONAL,
Counterclaim-Defendant,
and
CLS SERVICES LTD.,
Counterclaim-Defendant.

DECLARATION OF STEVEN J. GLASSMAN IN SUPPORT OF CLS' RENEWED MOTION FOR SUMMARY JUDGMENT THAT THE CLAIMS OF ALICE'S PATENTS ARE INVALID FOR LACK OF PATENTABLE SUBJECT MATTER

STEVEN J. GLASSMAN, under the penalty of perjury, hereby declares:

1. I am an attorney and a member of the firm of Kaye Scholer LLP, attorneys for Plaintiff and Counterclaim-Defendant CLS Bank International and

Counterclaim-Defendant CLS Services Ltd (collectively, "CLS"). I am familiar with the authenticity of the documents attached and I submit this declaration in support of CLS' renewed motion, under Fed. R. Civ. P. 56 and L Cv R 7, for summary judgment that the claims of Alice's patents are invalid for lack of patentable subject matter. The Exhibits listed below are cited in the Memorandum in Support of CLS' Renewed Motion for Summary Judgment that the Claims of Alice's Patents are Invalid for Lack of Patentable Subject Matter, dated August 27, 2010.

2. Attached as Exhibits 1 through 11 to this declaration are true copies of the following documents:

Exhibit 1	U.S. Patent No. 5,970,479
Exhibit 2	U.S. Patent No. 6,912,510
Exhibit 3	U.S. Patent No. 7,149,720
Exhibit 4	U.S. Patent No. 7,725,375
Exhibit 5	Office Action, dated September 3, 2003, from the prosecution history for U.S. Patent No. 6,912,510
Exhibit 6	Amendment and Reply Under 37 C.F.R. § 1.111, dated October 31, 2003, from the prosecution history for U.S. Patent No. 6,912,510
Exhibit 7	Terminal Disclaimer To Obviate A Double Patenting Rejection Over A Prior Patent, dated October 31, 2003, from the prosecution history for U.S. Patent No. 6,912,510
Exhibit 8	Office Action, dated December 28, 2005, from the prosecution history for U.S. Patent No. 7,149,720

Exhibit 9	Terminal Disclaimer To Obviate A Double Patenting Rejection Over A "Prior" Patent, dated January 27, 2006, from the prosecution history for U.S. Patent No. 7,149,720
Exhibit 10	Terminal Disclaimer To Obviate A Double Patenting Rejection Over "Prior" Patents, dated September 11, 2008, from the prosecution history of U.S. Patent No. 7,725, 375

Dated: New York, New York
August 27, 2010

/s/ Steven J. Glassman
Steven J. Glassman

EXHIBIT 1

United States Patent [19]

Shepherd

[11]	Patent Number:	5,970,479
[45]	Date of Patent:	Oct. 19, 1999

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[54] METHODS AND APPARATUS RELATING TO THE FORMULATION AND TRADING OF RISK MANAGEMENT CONTRACTS

[75] Inventor: Ian K. Shepherd, Toorak, Australia

[73] Assignees: Swychco Infrastructure Services Pty. Ltd., Melbourne, Australia; Swychco Support Services Pty. Ltd., Sydney, Australia

[21] Appl. No.: 08/070,136

[22] Filed: May 28, 1993

[30] Foreign Application Priority Data

May 29, 1992	[AU]	Australia	PL 2677
Jun. 30, 1992	[AU]	Australia	PL 3216

[51] Int. C1⁶ G06F 17/60

[52] U.S. Cl. 705/37; 705/4

[58] Field of Search 364/408; 705/4,705/37

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(List continued on next page.)

Primary Examiner—Gail O. Hayes

Assistant Examiner—Barton L Bainbridge

Attorney, Agent, or Firm—Sterne, Kessler, Goldstein & Fox P.L.L.C.

[57] ABSTRACT

Methods and apparatus which deal with the management of risk relating to specified, yet unknown, future events are disclosed.

'Sponsor' stakeholders specify a particular product relating to an event or phenomenon for which there is a range of possible future outcomes.

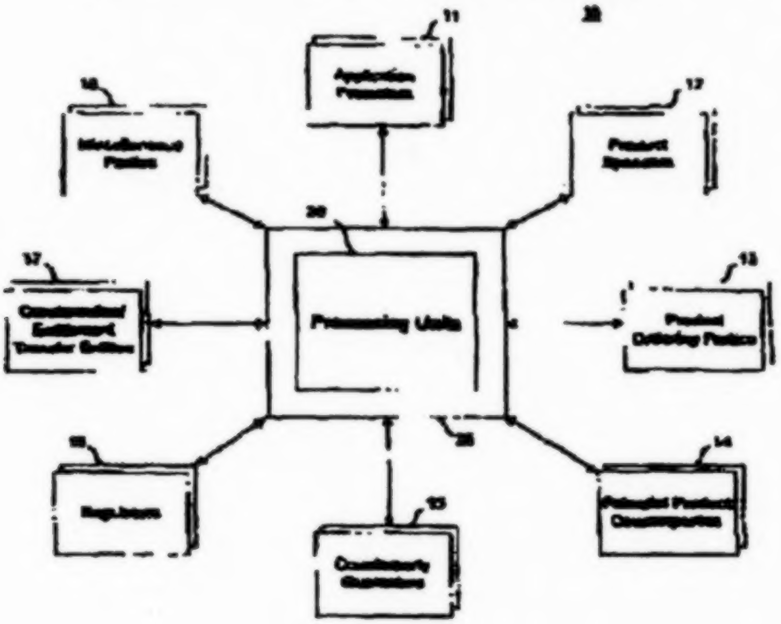
'Ordering' stakeholders then offer contracts relating to the predetermined phenomenon and corresponding range of outcomes. The offered contracts specify an entitlement or (pay-off) at the future time of maturity for each outcome, and a consideration (or premium) payable, in exchange, to a 'counter-party' stakeholder.

Independently of the offered contracts, the 'counter-party' stakeholders input data as to their view of the likelihood of occurrence of each outcome in the predetermined range into the future, or specifically at the predetermined date of maturity.

Each offered contract is priced by calculating counter-party premiums from the registered data, and a match attempted by a comparison of the offered premium with the calculated premiums.

Matched contracts can be further traded until maturity, and at-maturity processing handles the exchange of entitlement as between the matched parties to the contract.

39 Claims, 101 Drawing Sheets



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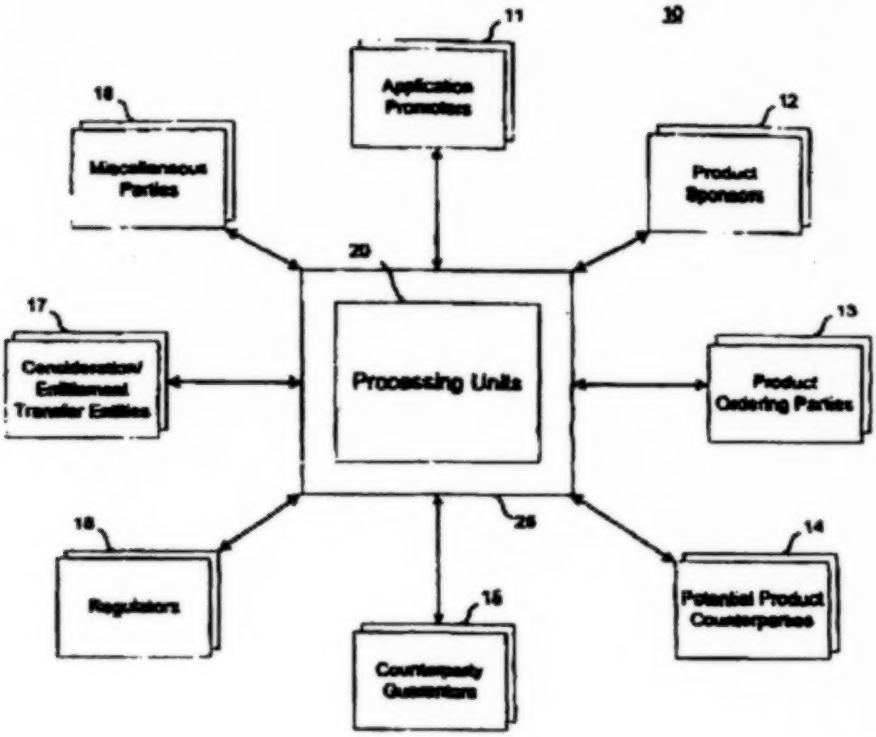

11
Application Promoters
10
18
Miscellaneous Parties
12
Product Sponsors
20
17
Consideration/ Entitlement Transfer Entities
Processing Units
13
Product Ordering Parties
16
Regulators
26
14
Potential Product Counterparties
15
Counterparty Guarantors

FIG. 1

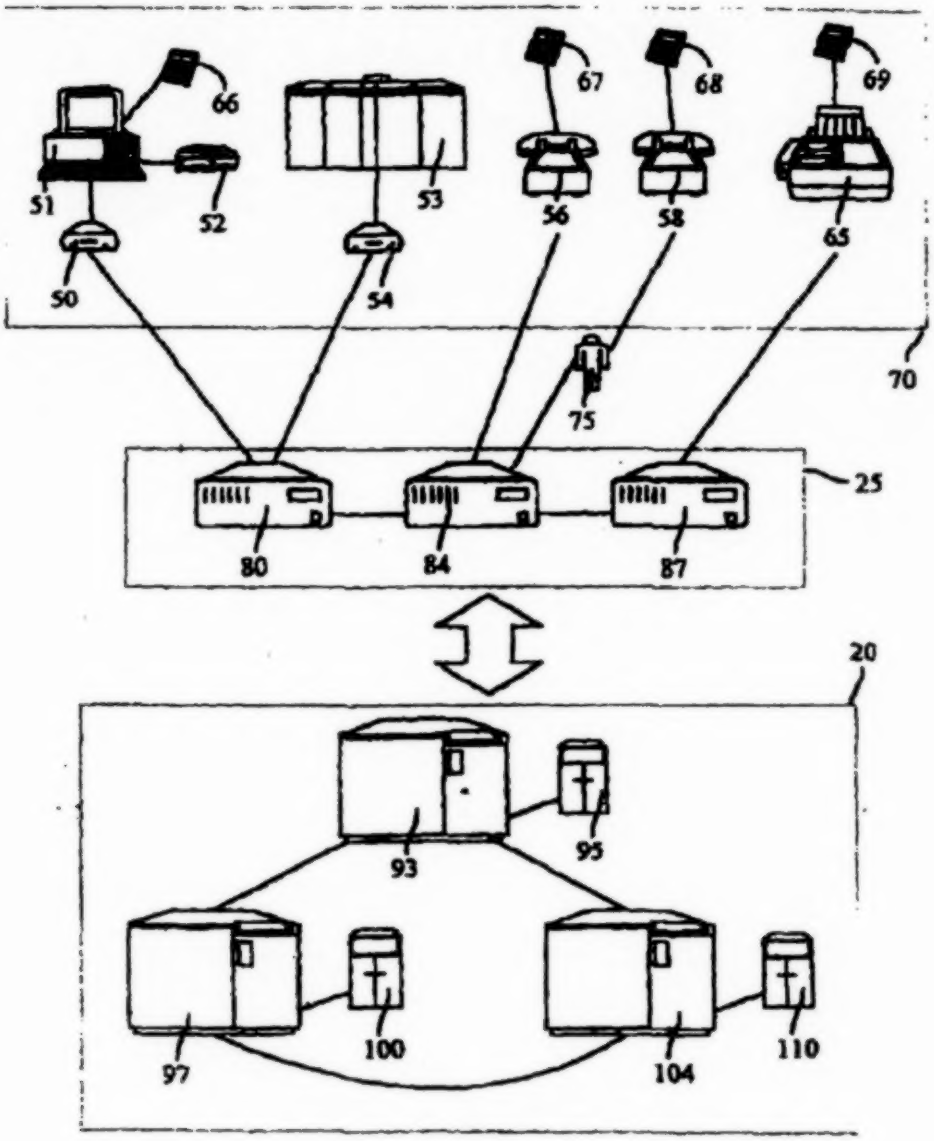


Fig. 2

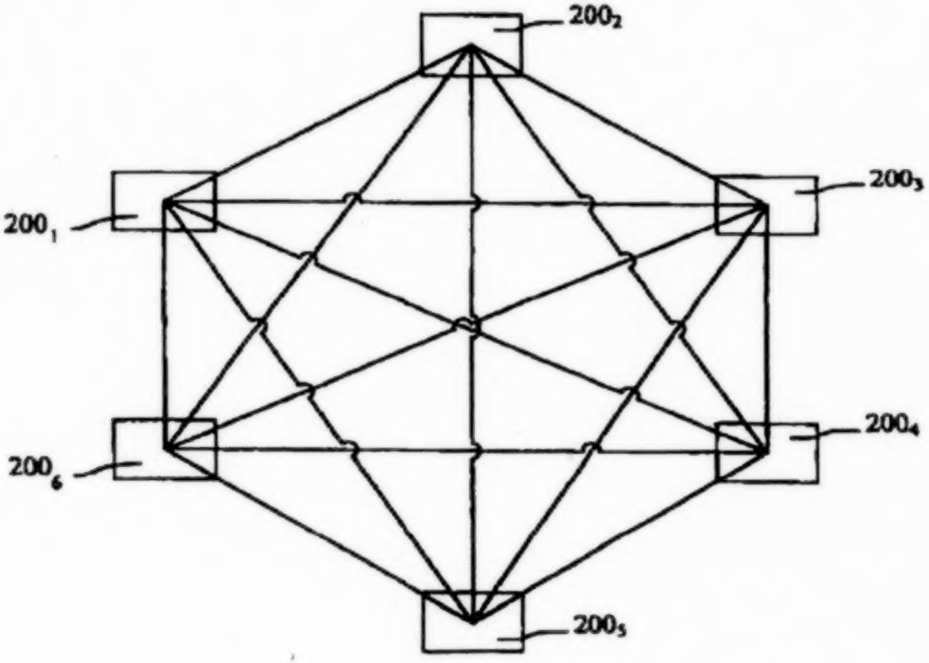

200₂
200₃
200₁
200₄
200₆
200₅

Fig. 2b

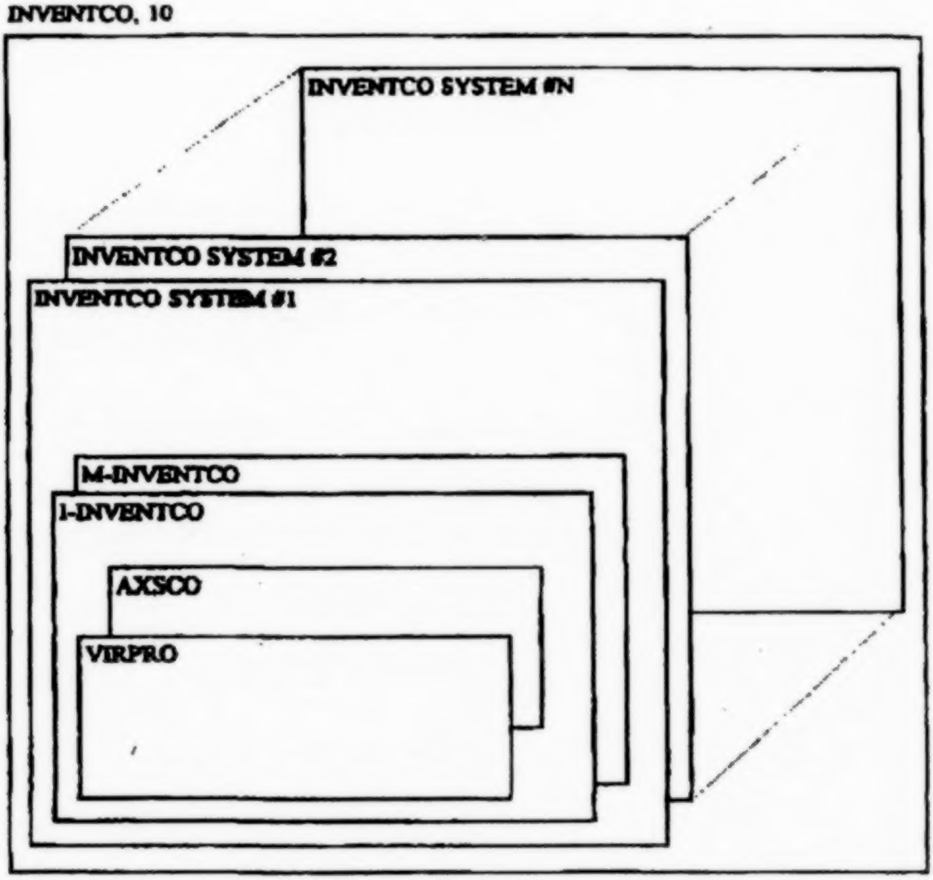

INVENTCO, 10
INVENTCO SYSTEM #N
INVENTCO SYSTEM #2
INVENTCO SYSTEM #1
M-INVENTCO
1-INVENTCO
AXSCO
VIRPRO

Fig. 3

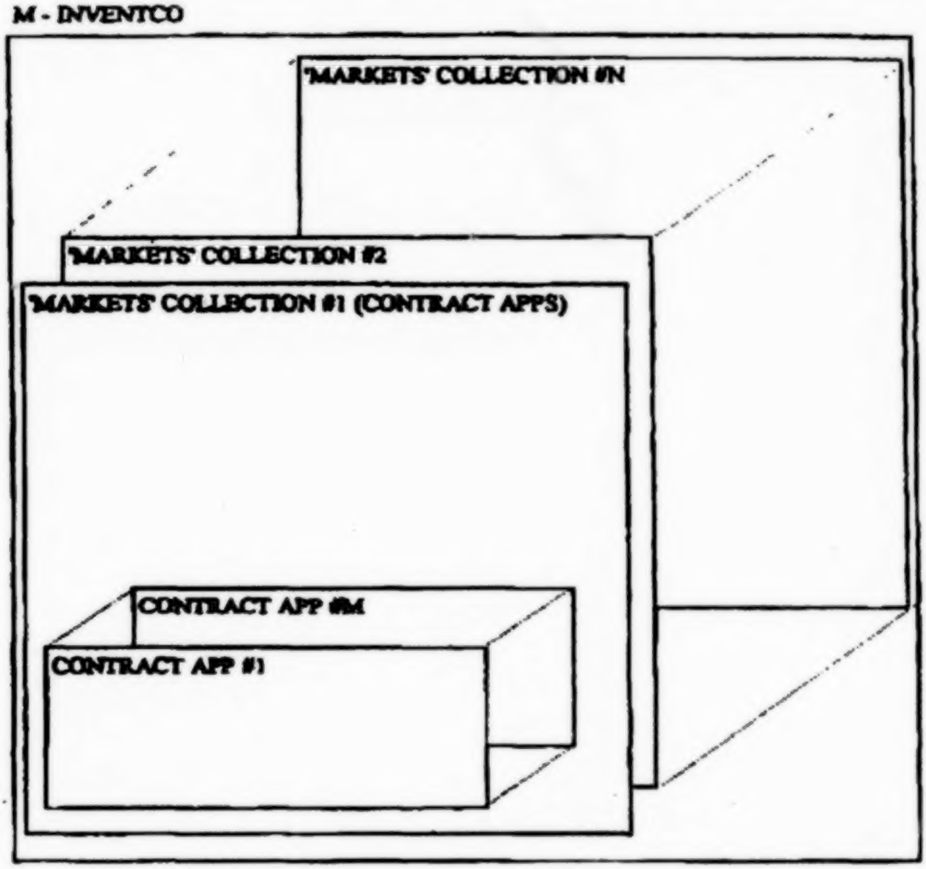

M - INVENTCO
'MARKETS' COLLECTION #N
'MARKETS' COLLECTION #2
'MARKETS' COLLECTION #1 (CONTRACT APPS)
CONTRACT APP #M
CONTRACT APP #1

Fig. 4

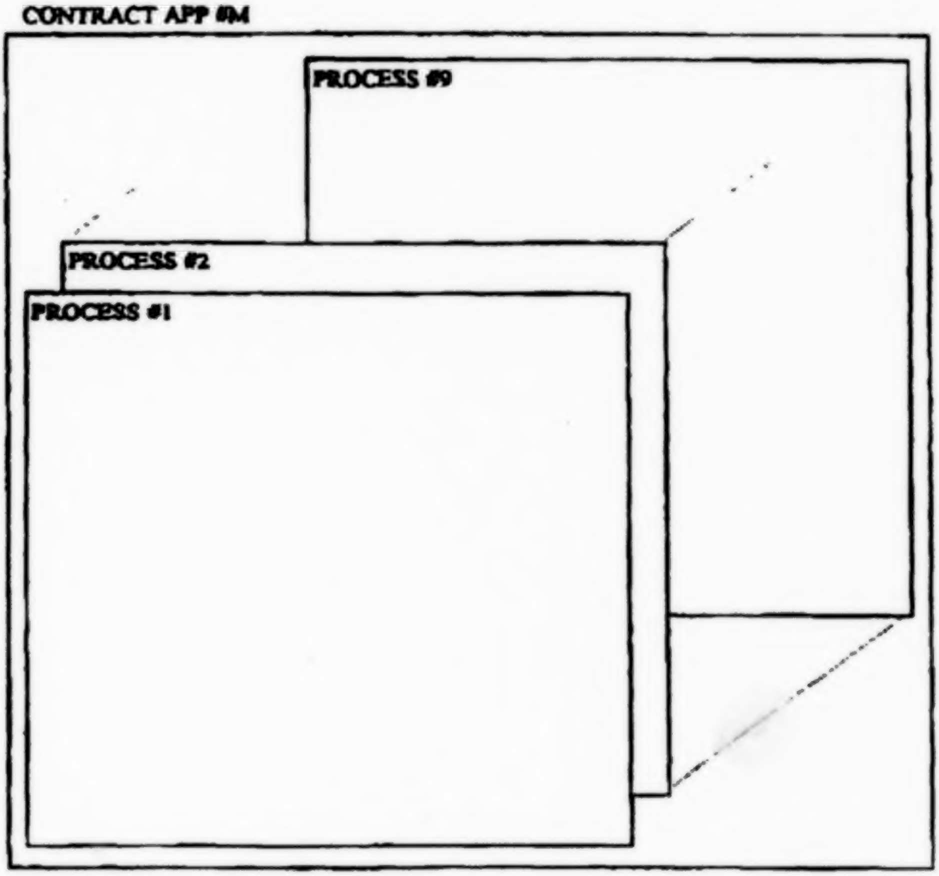

CONTRACT APP #M
PROCESS #9
PROCESS #2
PROCESS #1

Fig. 5

EXAMPLE I

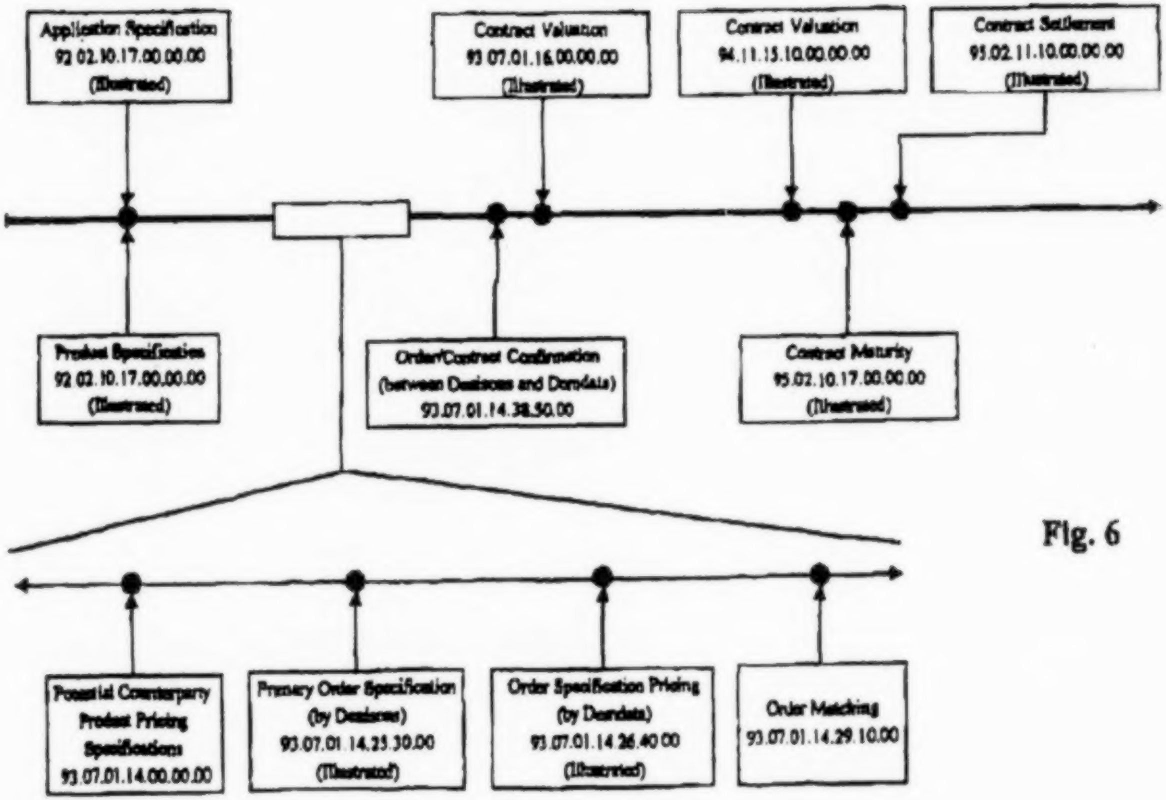

Application Specification
92.02.10.17.00.00.00
(Illustrated)
Contract Valuation
93.07.01.16.00.00.00
(Illustrated)
Contract Valuation
94.11.15.10.00.00.00
(Illustrated)
Contract Settlement
95.02.11.10.00.00.00
(Illustrated)
Product Specification
92.02.10.17.00.00.00
(Illustrated)
Order/Contract Confirmation
(between Denisons and Dondata)
93.07.01.14.38.50.00
Contract Maturity
95.02.10.17.00.00.00
(Illustrated)
Potential Counterparty
Product Pricing
Specifications
93.07.01.14.00.00.00
Primary Order Specification
(by Denisons)
93.07.01.14.25.30.00
(Illustrated)
Order Specification Pricing
(by Dondata)
93.07.01.14.26.40.00
(Illustrated)
Order Matching
93.07.01.14.29.10.00

Fig. 6

EXAMPLE II

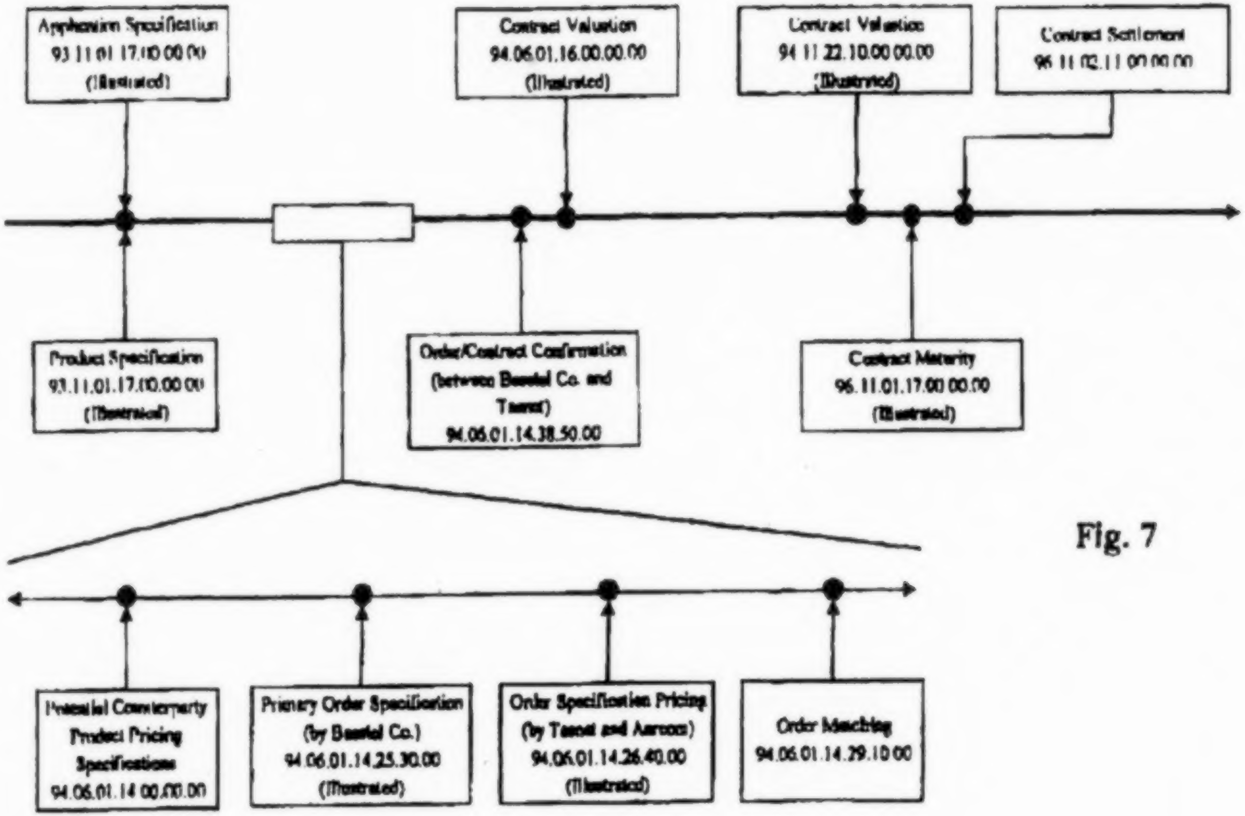

Application Specification
93.11.01.17.10.00.00
(Illustrated)
Product Specification
93.11.01.17.10.00.00
(Illustrated)
Contract Valuation
94.06.01.16.00.00.00
(Illustrated)
Order/Contract Confirmation
(between Bastel Co. and
Tasset)
94.06.01.14.38.50.00
Contract Valuation
94.11.22.10.00.00.00
(Illustrated)
Contract Maturity
96.11.01.17.00.00.00
(Illustrated)
Contract Settlement
96.11.02.11.00.00.00
Potential Counterparty
Product Pricing
Specifications
94.06.01.14.00.00.00
Primary Order Specification
(by Bastel Co.)
94.06.01.14.25.30.00
(Illustrated)
Order Specification Pricing
(by Tasset and Aarcon)
94.06.01.14.26.40.00
(Illustrated)
Order Matching
94.06.01.14.29.10.00

Fig. 7

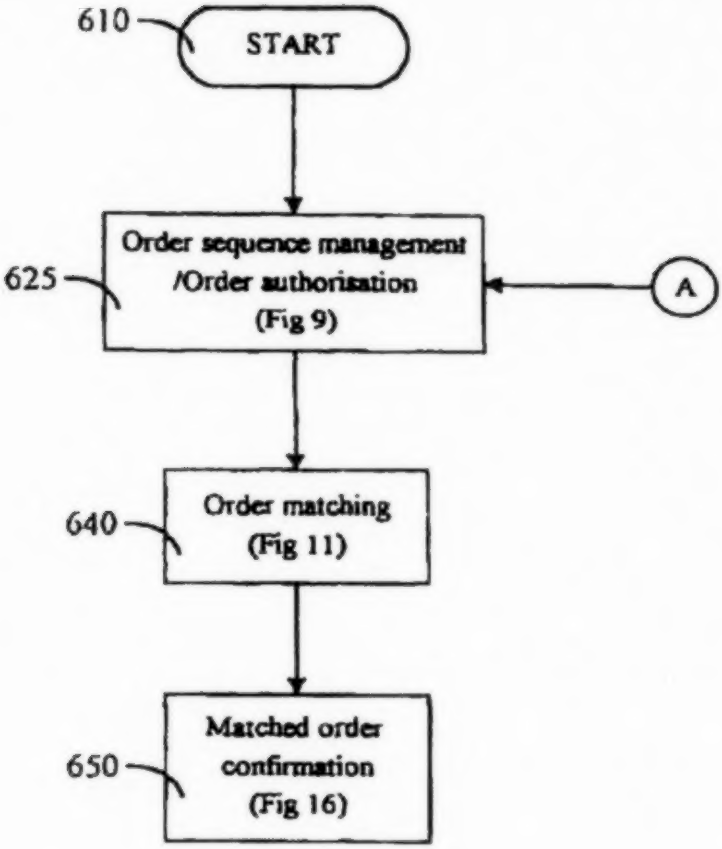

610
START
625
Order sequence management /Order authorisation (Fig 9)
A
640
Order matching (Fig 11)
650
Matched order confirmation (Fig 16)

Fig. 8

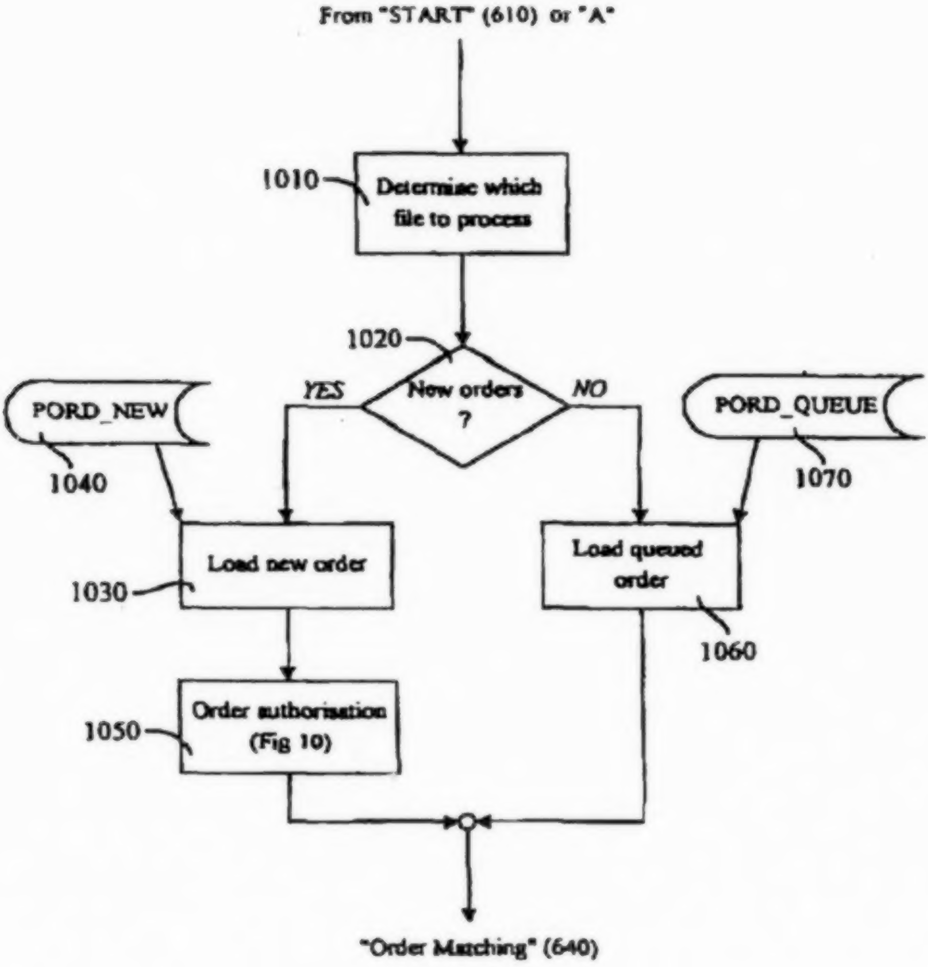

From "START" (610) or "A"
1010
Determine which file to process
1020
New orders ?
YES
NO
PORD_NEW
1040
PORD_QUEUE
1070
Load new order
1030
Load queued order
1060
Order authorisation (Fig 10)
1050
"Order Matching" (640)

Fig. 9

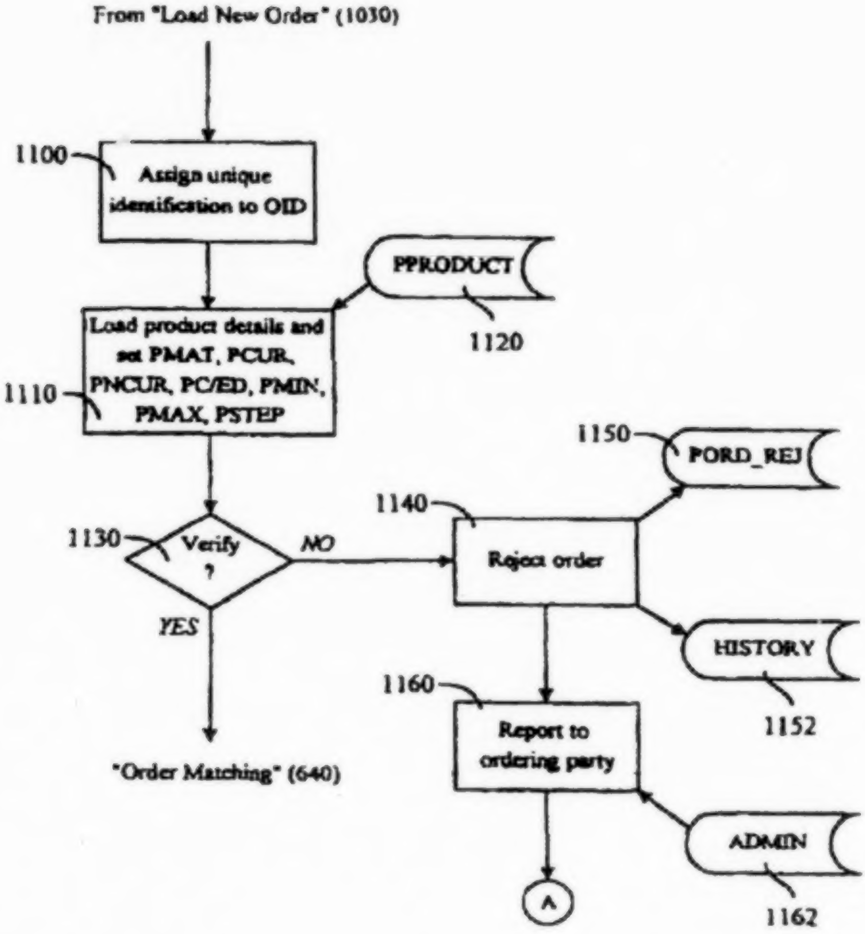

From "Load New Order" (1030)
1100
Assign unique identification to OID
PPRODUCT
1120
Load product details and set PMAT, PCUR, PNCUR, PC/ED, PMIN, PMAX, PSTEP
1110
1150
PORD_REJ
1140
1130
Verify ?
NO
Reject order
YES
HISTORY
1160
1152
Report to ordering party
"Order Matching" (640)
ADMIN
A
1162

Fig. 10

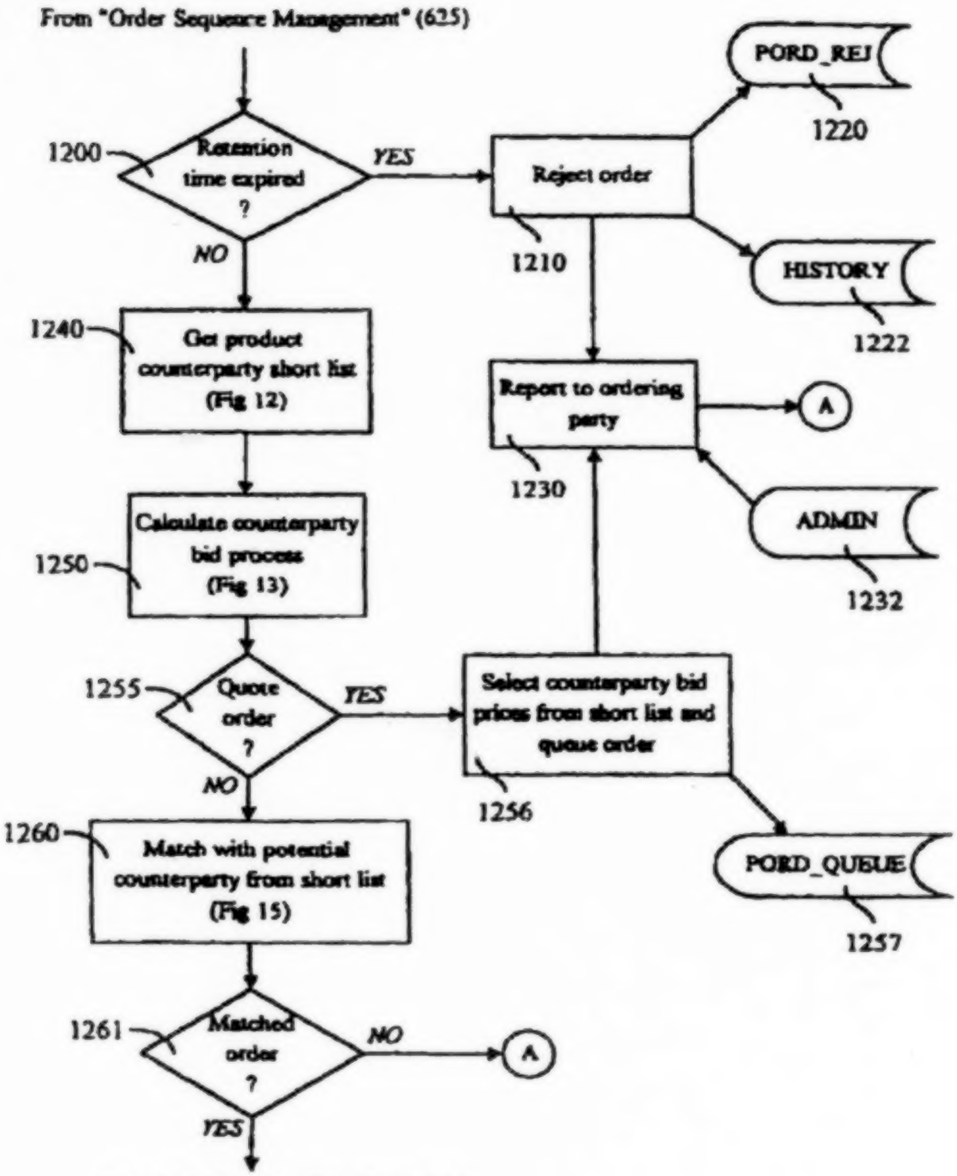

From "Order Sequence Management" (625)
1200
Retention time expired ?
YES
NO
Reject order
1210
PORD_REJ
1220
HISTORY
1222
1240
Get product counterparty short list (Fig 12)
Report to ordering party
1230
A
ADMIN
1232
1250
Calculate counterparty bid process (Fig 13)
1255
Quote order ?
YES
NO
Select counterparty bid prices from short list and queue order
1256
PORD_QUEUE
1257
1260
Match with potential counterparty from short list (Fig 15)
1261
Matched order ?
NO
A
YES
"Matched Order Confirmation" (650)

Fig. 11

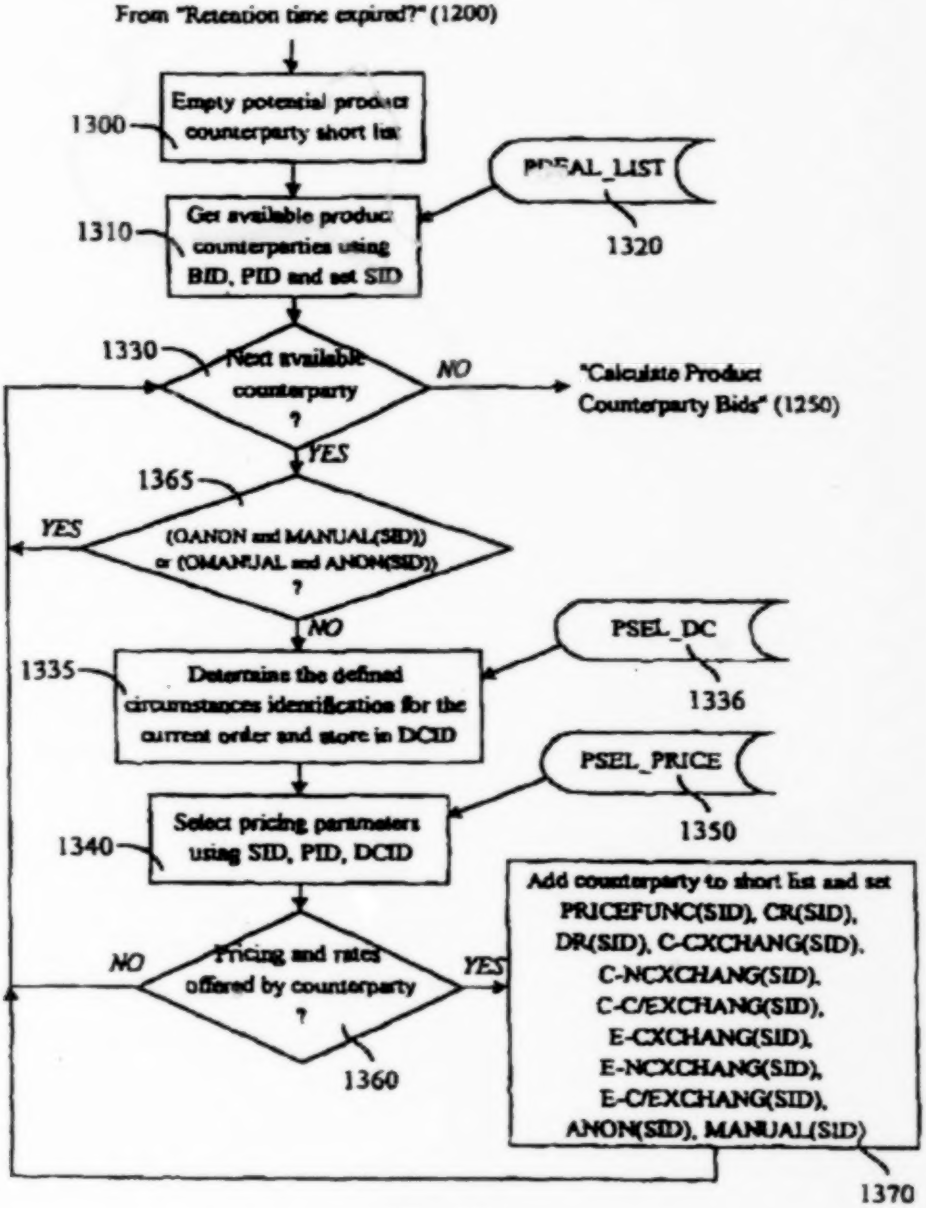

From "Retention time expired?" (1200)
1300
Empty potential product counterparty short list
PDEAL_LIST
1320
1310
Get available product counterparties using BID, PID and set SID
1330
Next available counterparty ?
NO
"Calculate Product Counterparty Bids" (1250)
YES
1365
YES
(OANON and MANUAL(SID)) or (OMANUAL and ANON(SID)) ?
NO
PSEL_DC
1336
1335
Determine the defined circumstances identification for the current order and store in DCID
PSEL_PRICE
1350
1340
Select pricing parameters using SID, PID, DCID
Add counterparty to short list and set PRICEFUNC(SID), CR(SID), DR(SID), C-CXCHANG(SID), C-NCXCHANG(SID), C-C/EXCHANG(SID), E-CXCHANG(SID), E-NCXCHANG(SID), E-C/EXCHANG(SID), ANON(SID), MANUAL(SID)
NO
Pricing and rates offered by counterparty ?
YES
1360
1370

Fig. 12

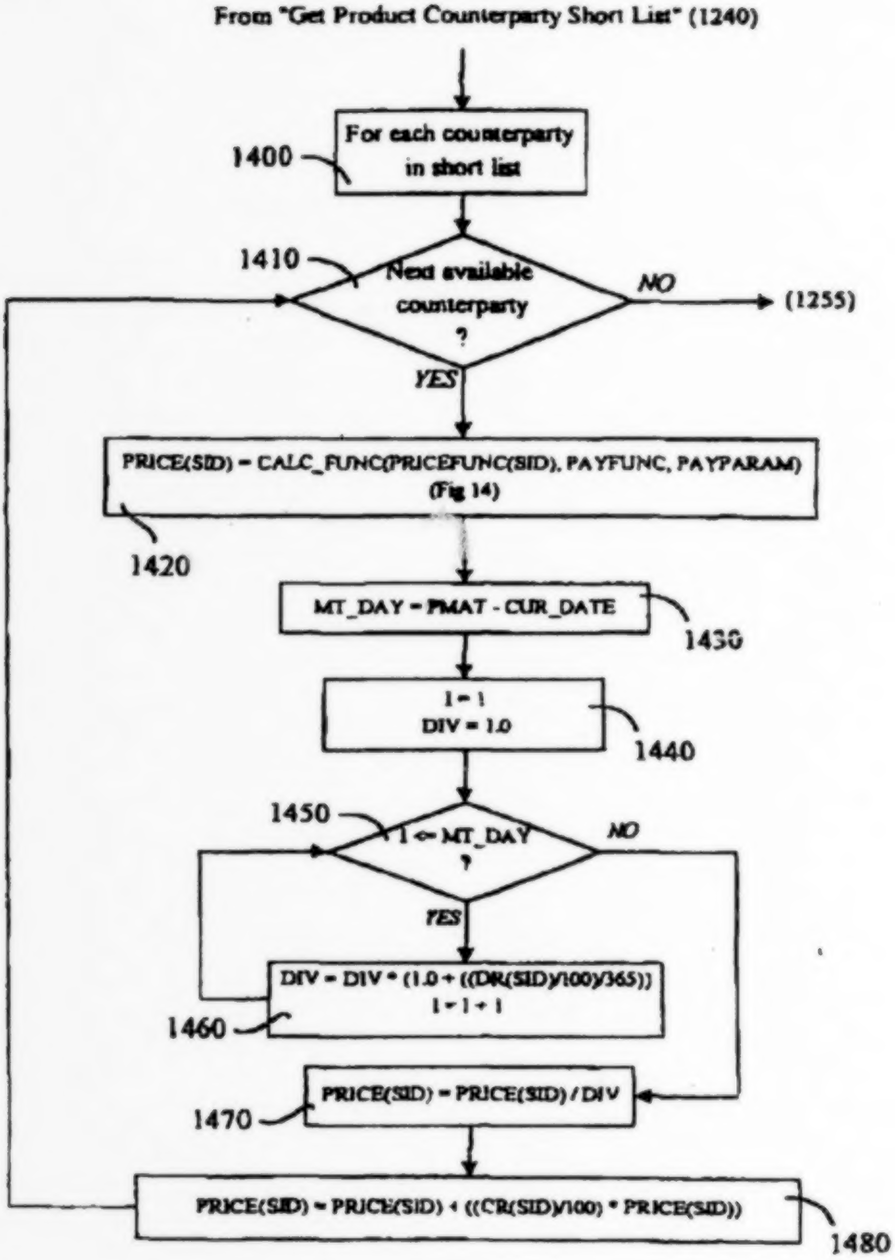

From "Get Product Counterparty Short List" (1240)
For each counterparty in short list
1400
1410
Next available counterparty ?
NO
(1255)
YES
PRICE(SID) = CALC_FUNC(PRICEFUNC(SID), PAYFUNC, PAYPARAM) (Fig 14)
1420
MT_DAY = PMAT - CUR_DATE
1430
I = 1
DIV = 1.0
1440
1450
I <= MT_DAY ?
NO
YES
DIV = DIV * (1.0 + ((DR(SID)/100)/365))
I = I + 1
1460
PRICE(SID) = PRICE(SID) / DIV
1470
PRICE(SID) = PRICE(SID) + ((CR(SID)/100) * PRICE(SID))
1480

Fig. 13

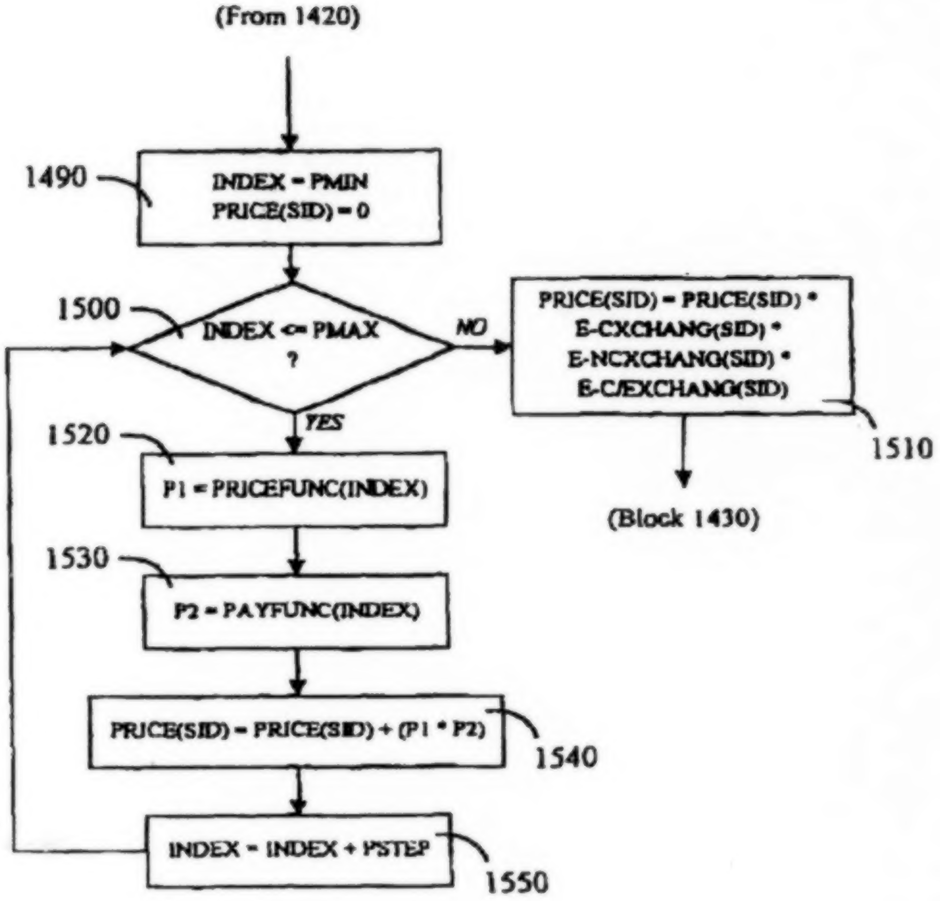
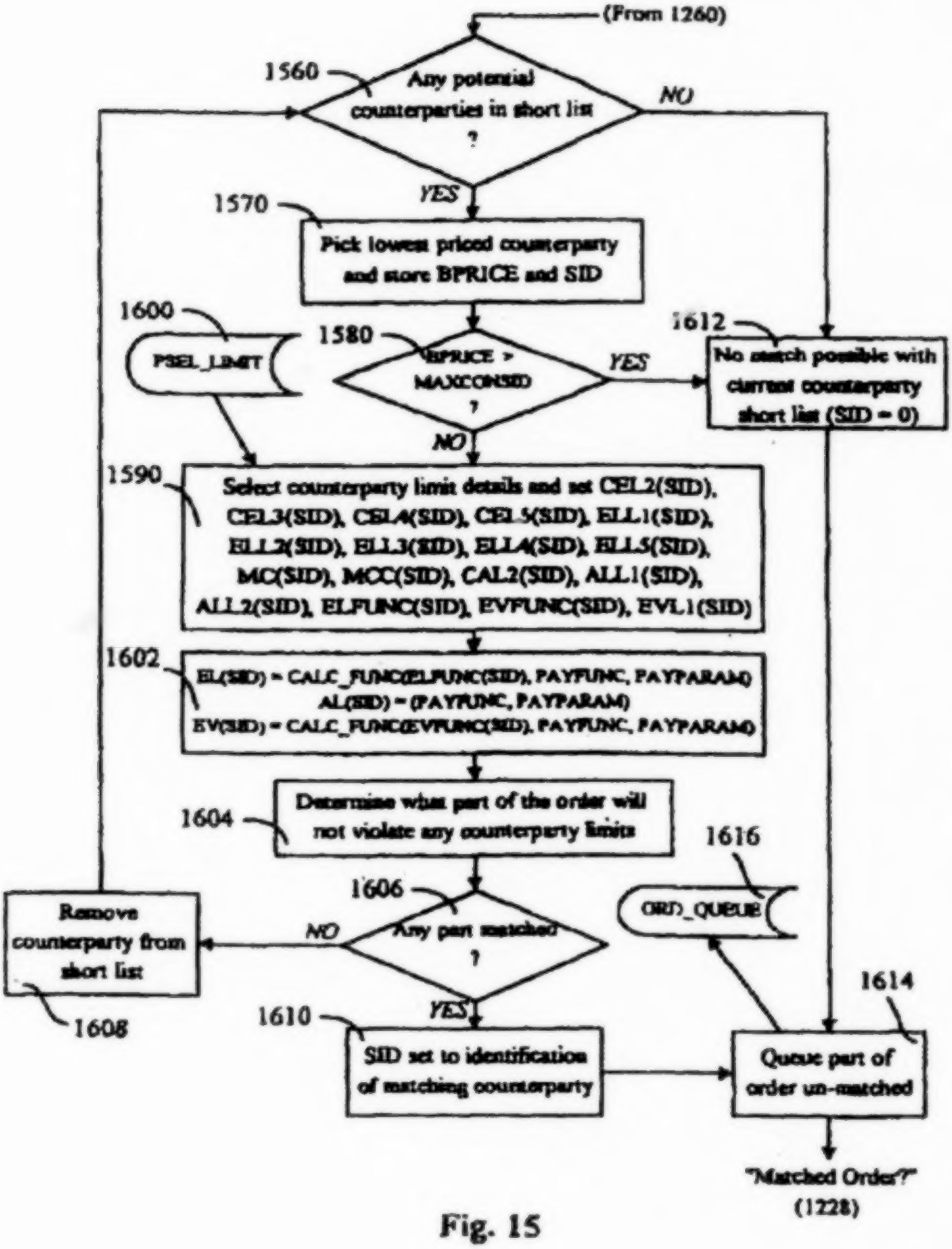

(From 1420)
1490
INDEX = PMIN
PRICE(SID) = 0
1500
INDEX <= PMAX ?
NO
PRICE(SID) = PRICE(SID) * E-CXCHANG(SID) * E-NCXCHANG(SID) * E-C/EXCHANG(SID)
1510
(Block 1430)
YES
1520
P1 = PRICEFUNC(INDEX)
1530
P2 = PAYFUNC(INDEX)
PRICE(SID) = PRICE(SID) + (P1 * P2)
1540
INDEX = INDEX + PSTEP
1550

Fig. 14



(From 1260)
1560
Any potential counterparties in short list ?
NO
YES
1570
Pick lowest priced counterparty and store BPRICE and SID
1600
PSEL_LIMIT
1580
BPRICE > MAXCONSID ?
YES
1612
No match possible with current counterparty short list (SID = 0)
NO
1590
Select counterparty limit details and set CEL2(SID), CEL3(SID), CEL4(SID), CEL5(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), MC(SID), MCC(SID), CAL2(SID), ALL1(SID), ALL2(SID), ELFUNC(SID), EVFUNC(SID), EVL1(SID)
1602
EL(SID) = CALC_FUNC(ELFUNC(SID), PAYFUNC, PAYPARAM)
AL(SID) = (PAYFUNC, PAYPARAM)
EV(SID) = CALC_FUNC(EVFUNC(SID), PAYFUNC, PAYPARAM)
1604
Determine what part of the order will not violate any counterparty limits
1616
ORD_QUEUE
1606
Any part matched ?
NO
Remove counterparty from short list
1608
YES
1610
SID set to identification of matching counterparty
1614
Queue part of order un-matched
"Matched Order?" (1228)

Fig. 15

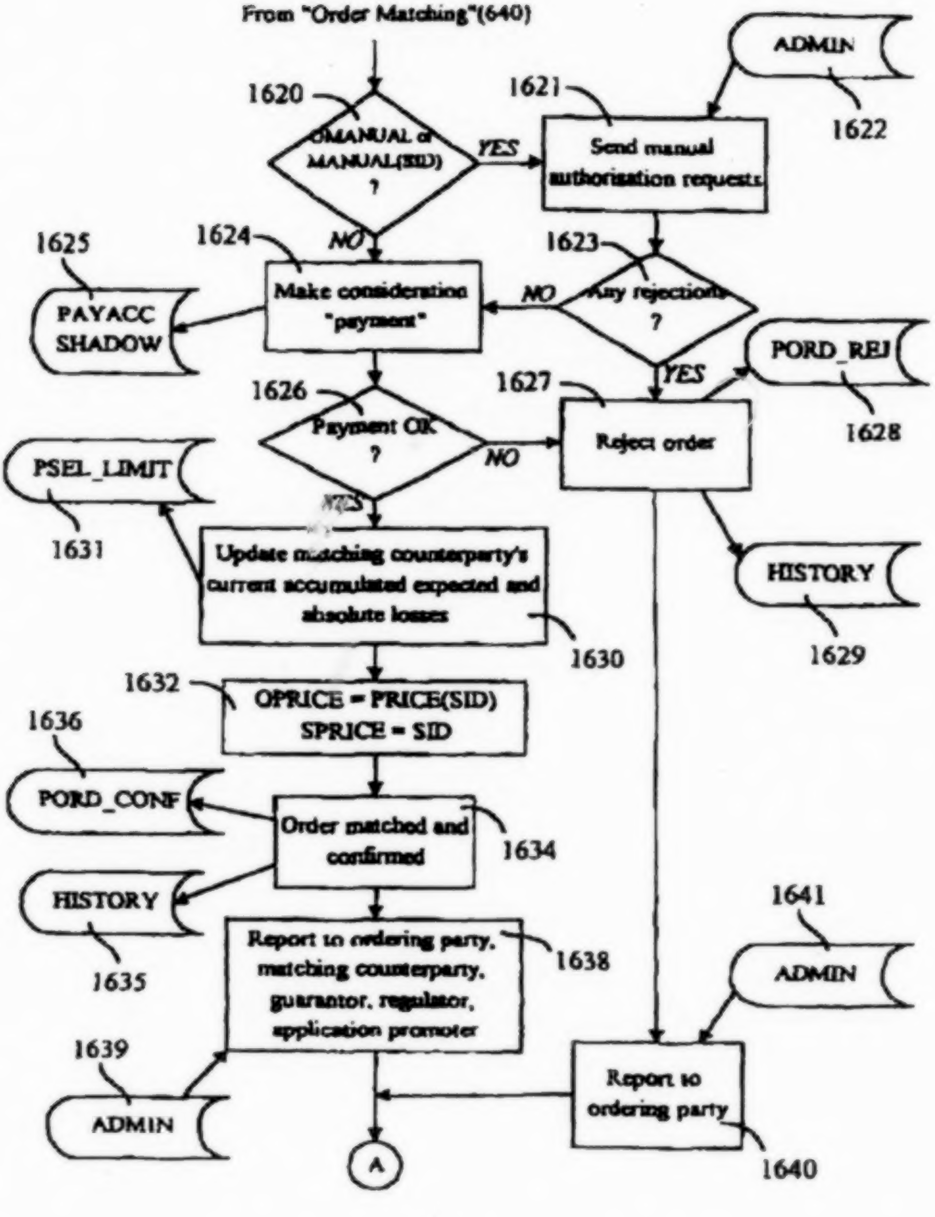

From "Order Matching"(640)
1620
OMANUAL or MANUAL(SID) ?
YES
1621
Send manual authorisation requests
ADMIN
1622
NO
1624
Make consideration "payment"
1625
PAYACC SHADOW
1623
Any rejections ?
NO
YES
PORD_REJ
1628
1626
Payment OK ?
NO
1627
Reject order
PSEL_LIMIT
1631
YES
Update matching counterparty's current accumulated expected and absolute losses
1630
HISTORY
1629
1632
OPRICE = PRICE(SID)
SPRICE = SID
1636
PORD_CONF
Order matched and confirmed
1634
HISTORY
1635
Report to ordering party, matching counterparty, guarantor, regulator, application promoter
1638
1641
ADMIN
1639
ADMIN
Report to ordering party
1640
A

Fig. 16

EXAMPLE III

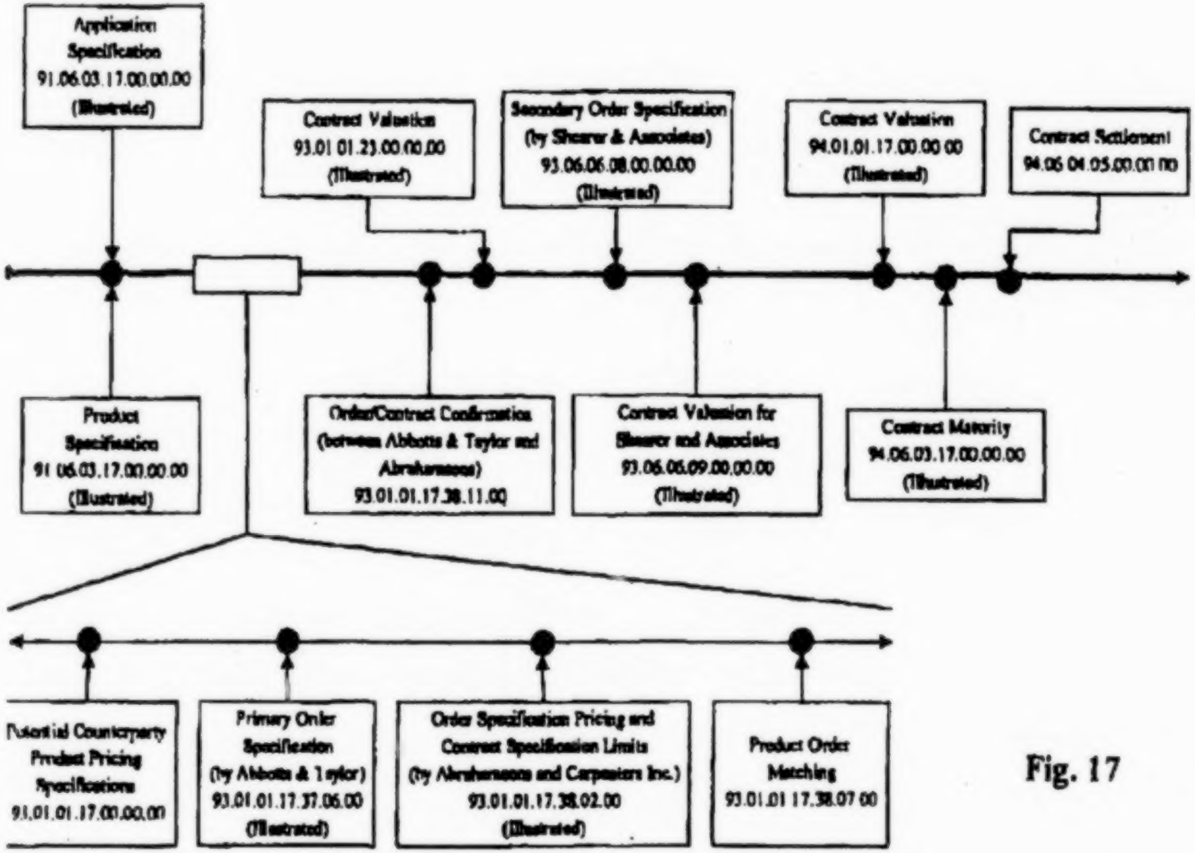

Application Specification
91.06.03.17.00.00.00
(Illustrated)
Contract Valuation
93.01.01.23.00.00.00
(Illustrated)
Secondary Order Specification
(by Shearer & Associates)
93.06.06.08.00.00.00
(Illustrated)
Contract Valuation
94.01.01.17.00.00.00
(Illustrated)
Contract Settlement
94.06.04.05.00.00.00
Product Specification
91.06.03.17.00.00.00
(Illustrated)
Order/Contract Confirmation
(between Abbotts & Taylor and Abrahamsons)
93.01.01.17.38.11.00
Contract Valuation for Shearer and Associates
93.06.06.09.00.00.00
(Illustrated)
Contract Maturity
94.06.03.17.00.00.00
(Illustrated)
Potential Counterparty Product Pricing Specifications
93.01.01.17.00.00.00
Primary Order Specification
(by Abbotts & Taylor)
93.01.01.17.37.06.00
(Illustrated)
Order Specification Pricing and Contract Specification Limits
(by Abrahamsons and Carpenters Inc.)
93.01.01.17.38.02.00
(Illustrated)
Product Order Matching
93.01.01.17.38.07.00

Fig. 17

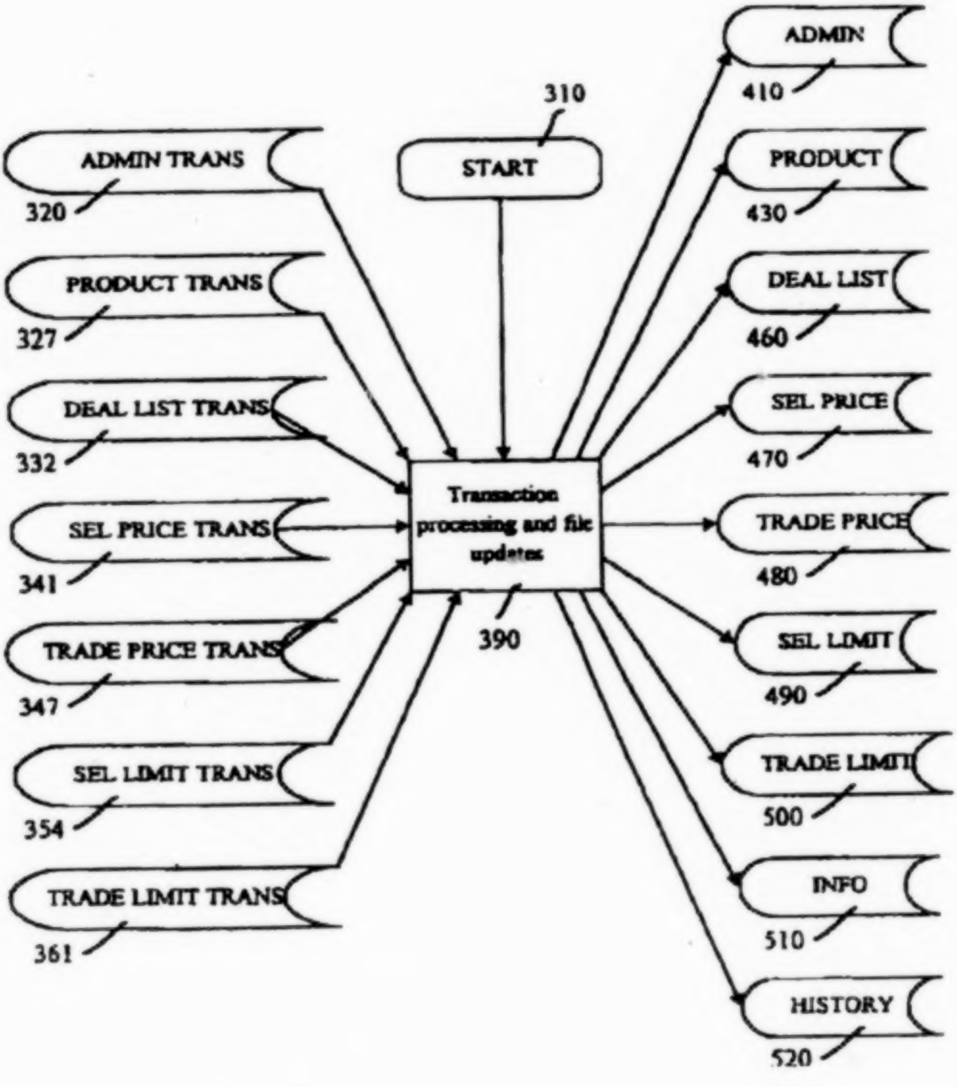

ADMIN TRANS
320
PRODUCT TRANS
327
DEAL LIST TRANS
332
SEL PRICE TRANS
341
TRADE PRICE TRANS
347
SEL LIMIT TRANS
354
TRADE LIMIT TRANS
361
START
310
Transaction processing and file updates
390
ADMIN
410
PRODUCT
430
DEAL LIST
460
SEL PRICE
470
TRADE PRICE
480
SEL LIMIT
490
TRADE LIMIT
500
INFO
510
HISTORY
520

Fig. 18

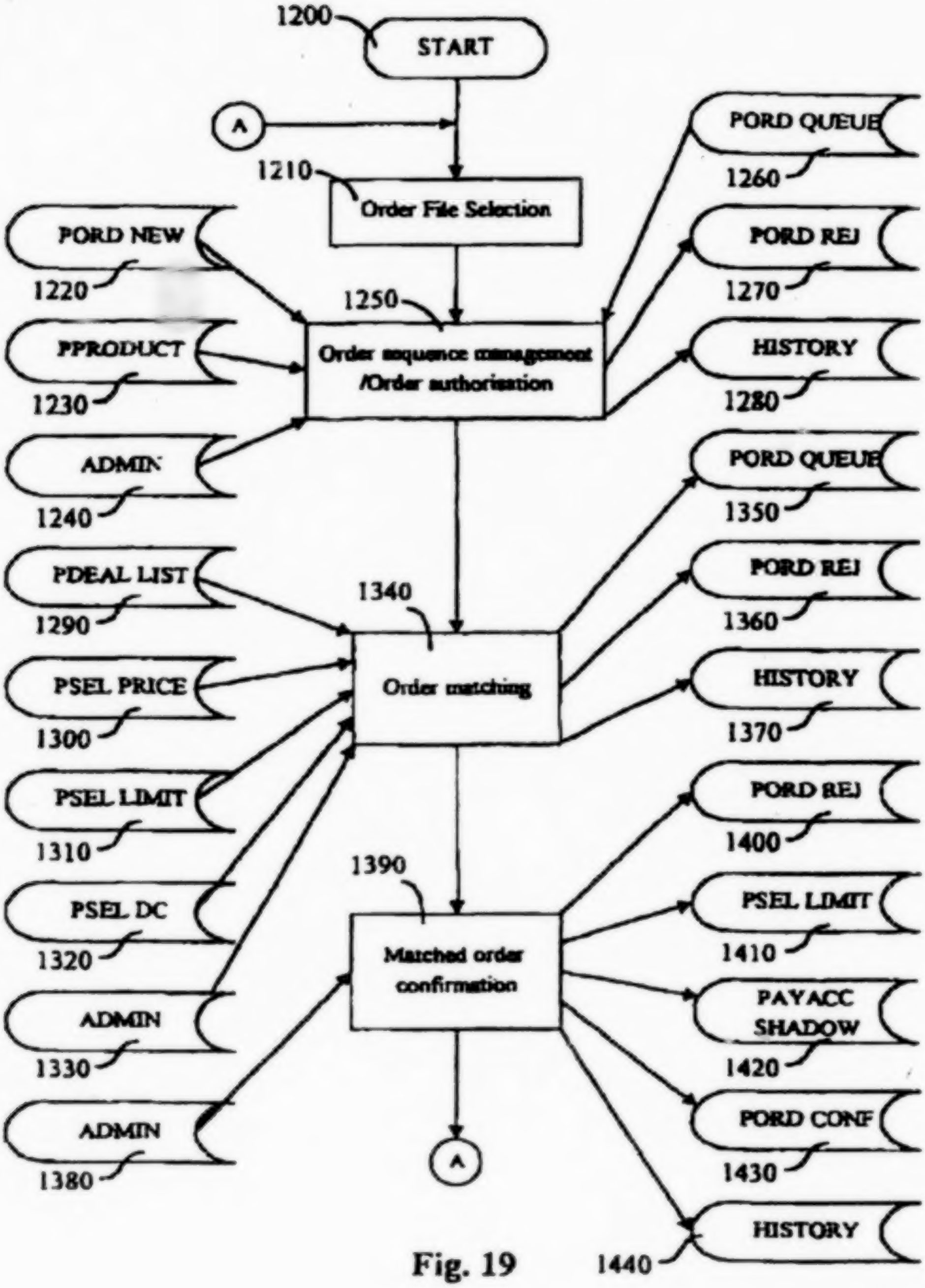

1200
START
A
1210
Order File Selection
PORD NEW
1220
PPRODUCT
1230
ADMIN
1240
1250
Order sequence management /Order authorisation
PORD QUEUE
1260
PORD REJ
1270
HISTORY
1280
PDEAL LIST
1290
PSEL PRICE
1300
PSEL LIMIT
1310
PSEL DC
1320
ADMIN
1330
ADMIN
1380
1340
Order matching
PORD QUEUE
1350
PORD REJ
1360
HISTORY
1370
1390
Matched order confirmation
PORD REJ
1400
PSEL LIMIT
1410
PAYACC SHADOW
1420
PORD CONF
1430
HISTORY
1440
A

Fig. 19

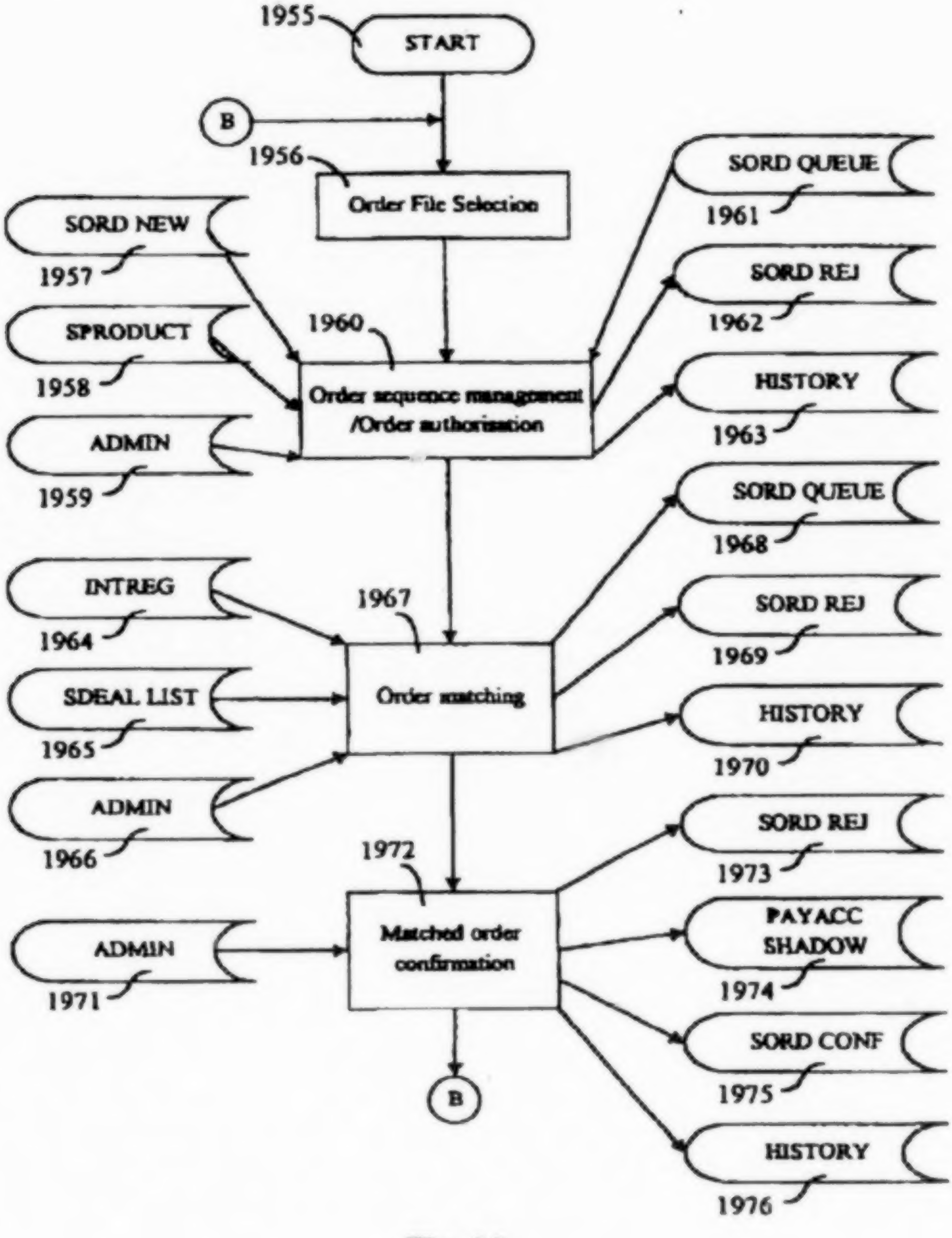

1955
START
B
1956
Order File Selection
SORD NEW
1957
SPRODUCT
1958
ADMIN
1959
1960
Order sequence management /Order authorisation
SORD QUEUE
1961
SORD REJ
1962
HISTORY
1963
INTREG
1964
SDEAL LIST
1965
ADMIN
1966
1967
Order matching
SORD QUEUE
1968
SORD REJ
1969
HISTORY
1970
ADMIN
1971
1972
Matched order confirmation
SORD REJ
1973
PAYACC SHADOW
1974
SORD CONF
1975
HISTORY
1976
B

Fig. 20

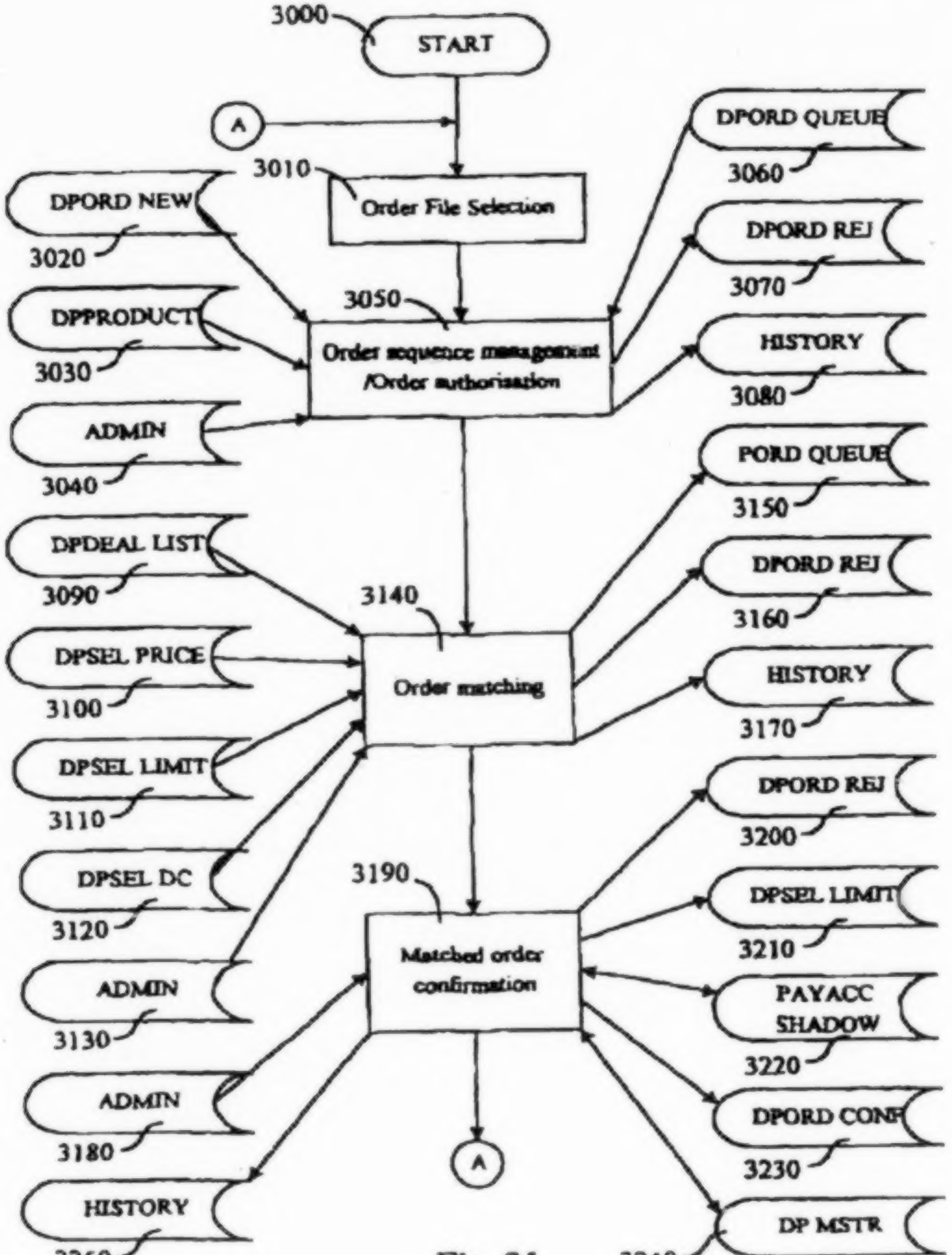

3000
START
A
3010
Order File Selection
DPORD NEW
3020
DPPRODUCT
3030
ADMIN
3040
3050
Order sequence management /Order authorisation
DPORD QUEUE
3060
DPORD REJ
3070
HISTORY
3080
DPDEAL LIST
3090
DPSEL PRICE
3100
DPSEL LIMIT
3110
DPSEL DC
3120
ADMIN
3130
3140
Order matching
PORD QUEUE
3150
DPORD REJ
3160
HISTORY
3170
3190
Matched order confirmation
DPORD REJ
3200
DPSEL LIMIT
3210
PAYACC SHADOW
3220
DPORD CONF
3230
DP MSTR
3240
ADMIN
3180
HISTORY
3250
A

Fig. 21

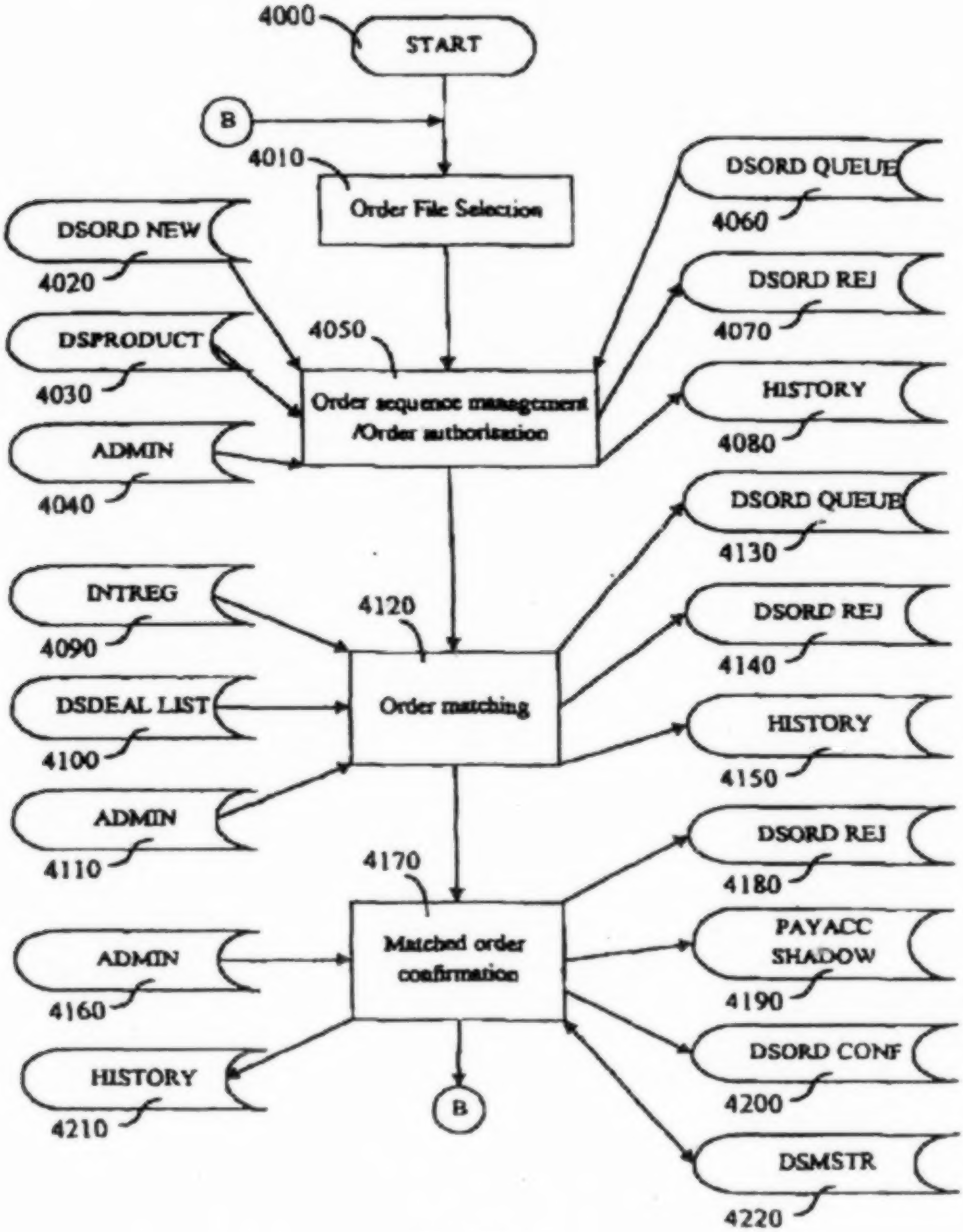

4000
START
B
4010
Order File Selection
DSORD NEW
4020
DSPRODUCT
4030
ADMIN
4040
4050
Order sequence management /Order authorization
DSORD QUEUE
4060
DSORD REJ
4070
HISTORY
4080
INTREG
4090
DSDEAL LIST
4100
ADMIN
4110
4120
Order matching
DSORD QUEUE
4130
DSORD REJ
4140
HISTORY
4150
4170
Matched order confirmation
ADMIN
4160
HISTORY
4210
B
DSORD REJ
4180
PAYACC SHADOW
4190
DSORD CONF
4200
DSMSTR
4220

Fig. 22

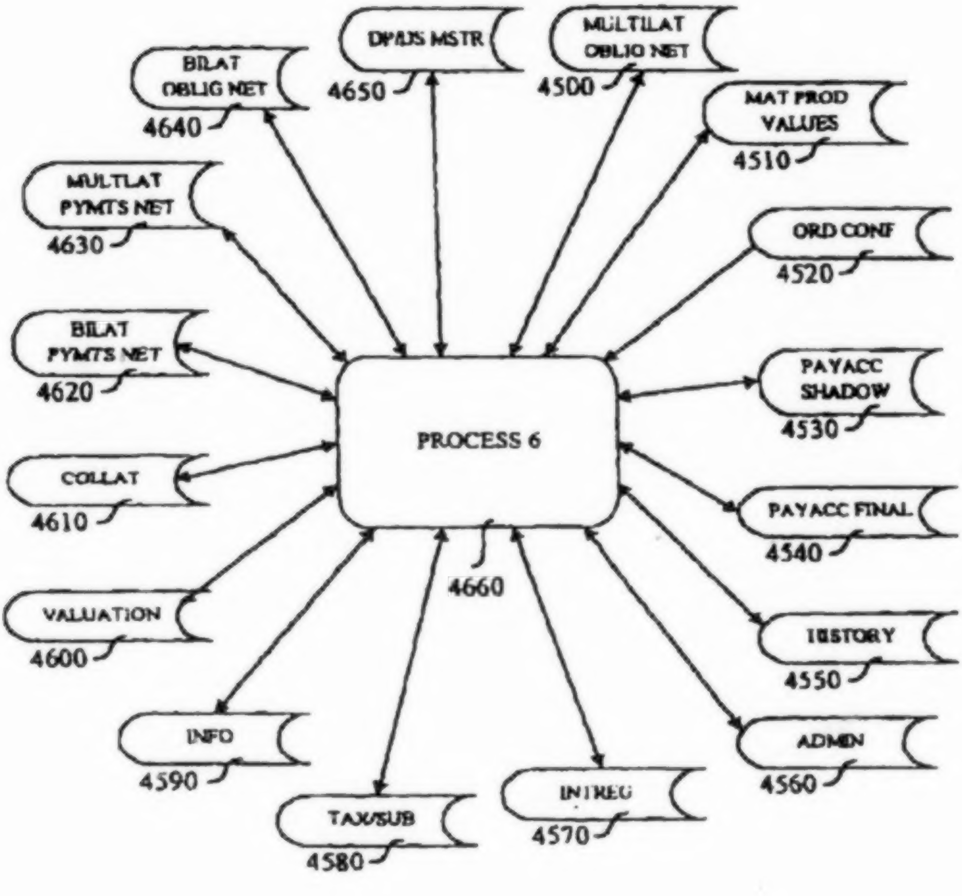

BILAT OBLIG NET
4640
DP/US MSTR
4650
MULTILAT OBLIG NET
4500
MAT PROD VALUES
4510
MULTLAT PYMTS NET
4630
ORD CONF
4520
BILAT PYMTS NET
4620
PAYACC SHADOW
4530
PROCESS 6
COLLAT
4610
PAYACC FINAL
4540
4660
VALUATION
4600
HISTORY
4550
INFO
4590
ADMIN
4560
INTREG
4570
TAX/SUB
4580

Fig. 23

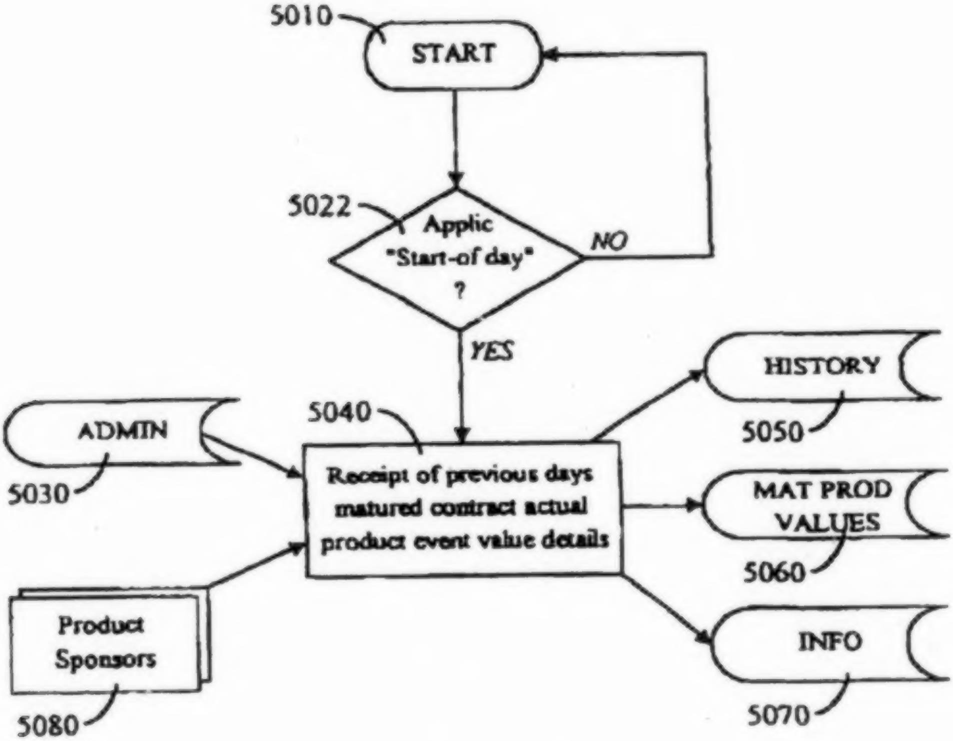

5010
START
5022
Applic "Start-of day" ?
NO
YES
5040
Receipt of previous days matured contract actual product event value details
ADMIN
5030
Product Sponsors
5080
HISTORY
5050
MAT PROD VALUES
5060
INFO
5070

Fig. 24

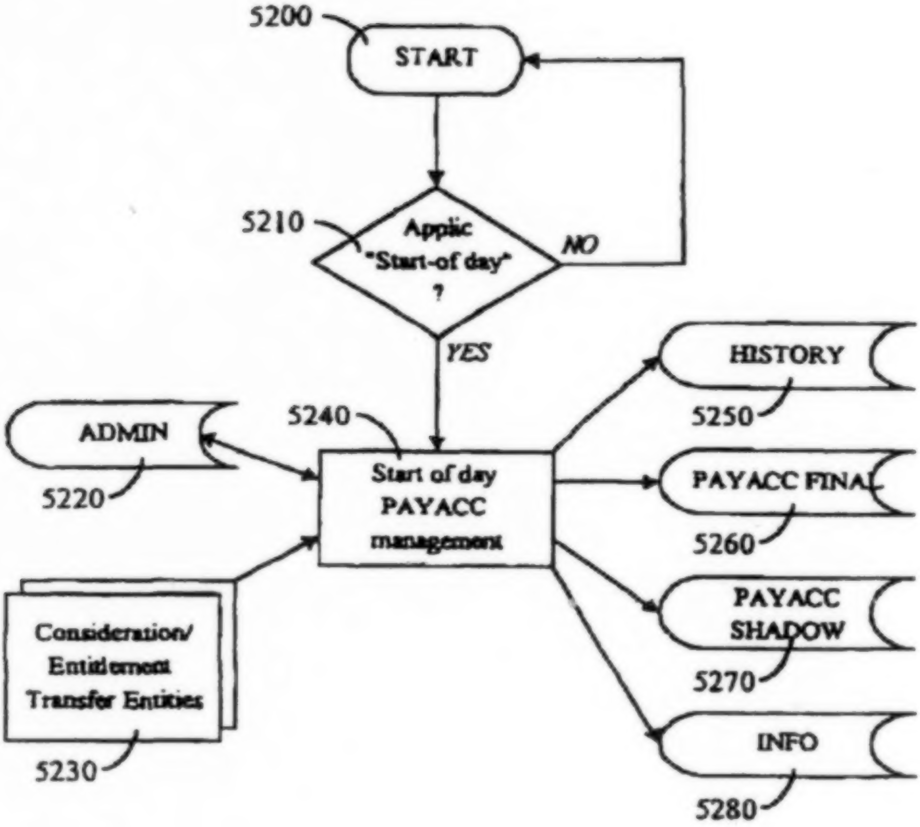

5200
START
5210
Applic "Start-of day" ?
NO
YES
5240
Start of day PAYACC management
ADMIN
5220
Consideration/ Entitlement Transfer Entities
5230
HISTORY
5250
PAYACC FINAL
5260
PAYACC SHADOW
5270
INFO
5280

Fig. 25

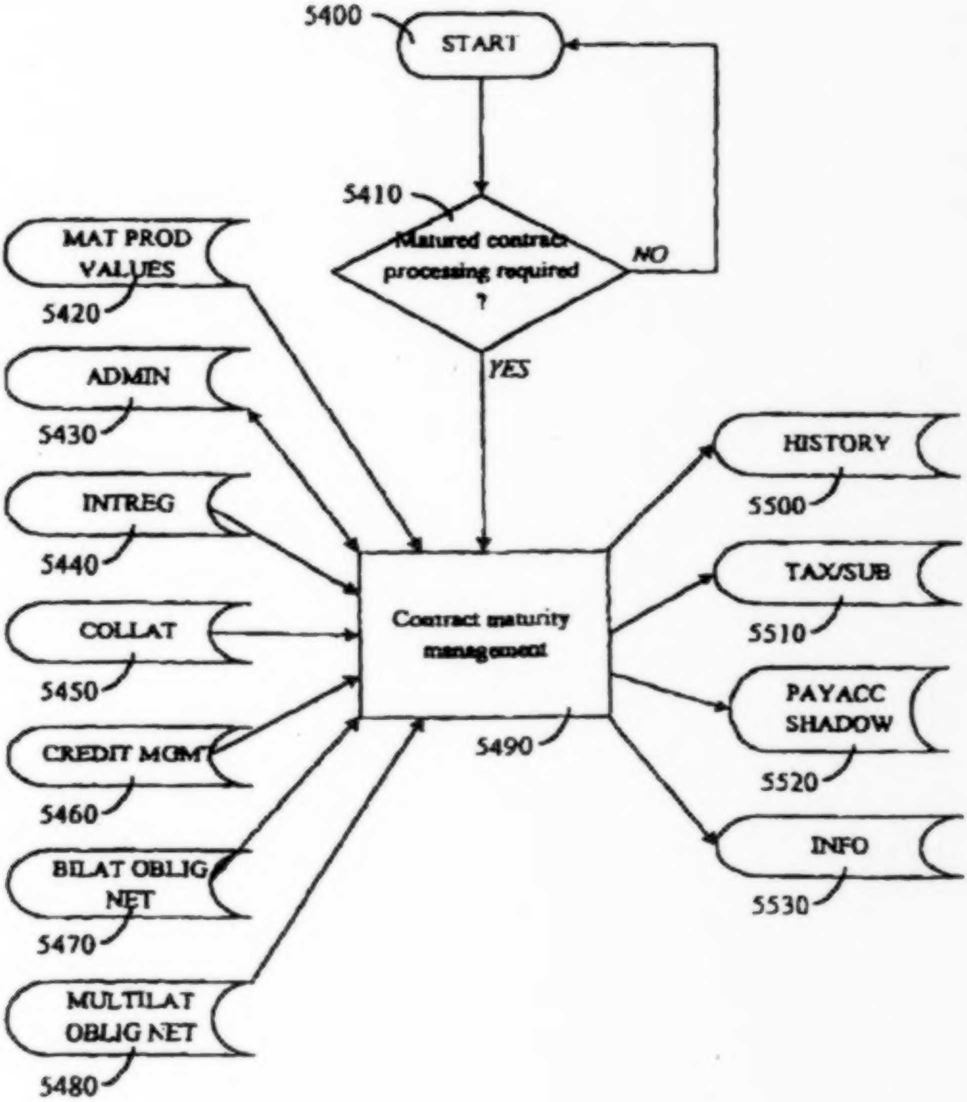

5400
START
5410
Matured contract processing required ?
NO
YES
MAT PROD VALUES
5420
ADMIN
5430
INTREG
5440
COLLAT
5450
CREDIT MGMT
5460
BILAT OBLIG NET
5470
MULTILAT OBLIG NET
5480
Contract maturity management
5490
HISTORY
5500
TAX/SUB
5510
PAYACC SHADOW
5520
INFO
5530

Fig. 26

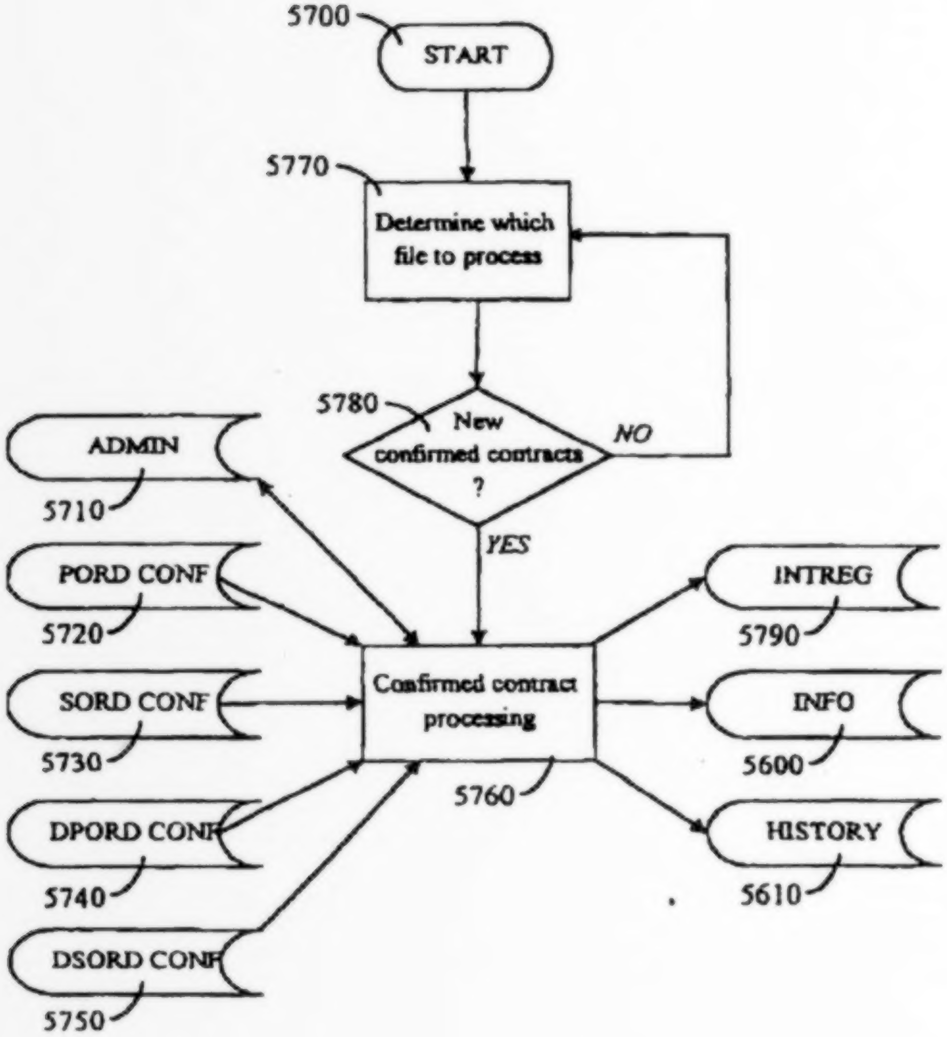

5700
START
5770
Determine which file to process
5780
New confirmed contracts ?
NO
YES
ADMIN
5710
PORD CONF
5720
SORD CONF
5730
DPORD CONF
5740
DSORD CONF
5750
Confirmed contract processing
5760
INTREG
5790
INFO
5600
HISTORY
5610

Fig 27

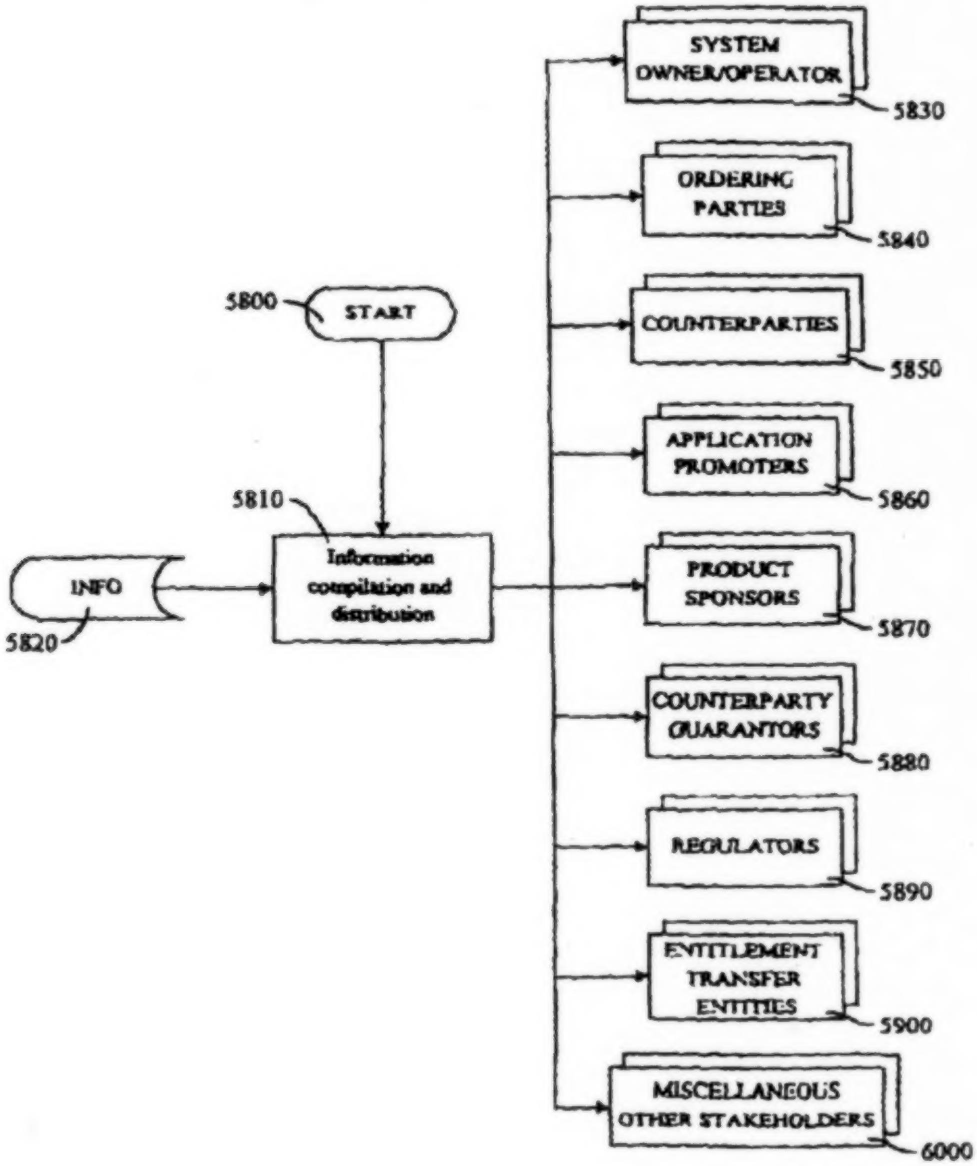

5800
START
5810
Information compilation and distribution
INFO
5820
SYSTEM OWNER/OPERATOR
5830
ORDERING PARTIES
5840
COUNTERPARTIES
5850
APPLICATION PROMOTERS
5860
PRODUCT SPONSORS
5870
COUNTERPARTY GUARANTORS
5880
REGULATORS
5890
ENTITLEMENT TRANSFER ENTITIES
5900
MISCELLANEOUS OTHER STAKEHOLDERS
6000

Fig. 28

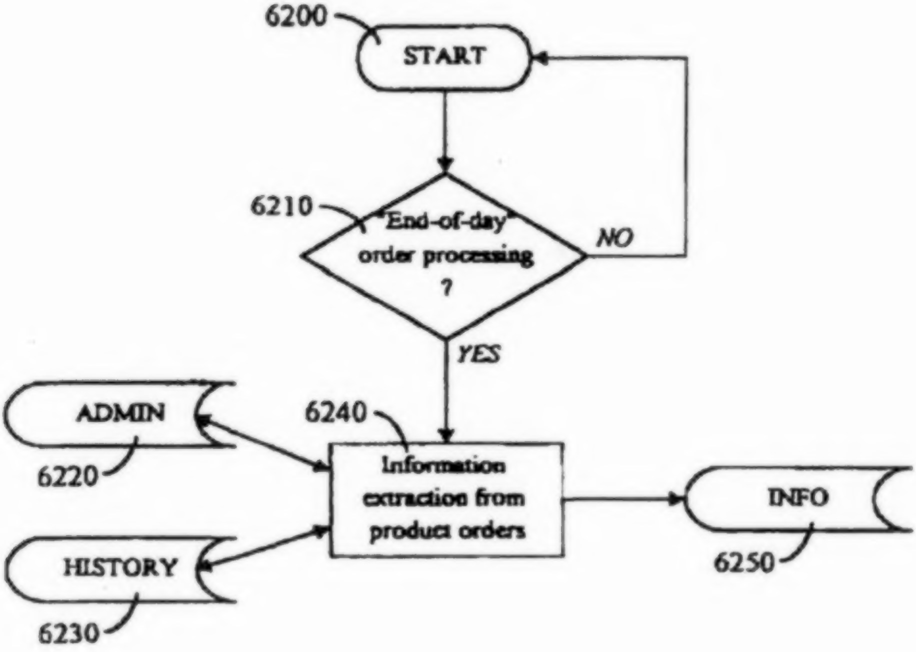

6200
START
6210
"End-of-day" order processing ?
NO
YES
ADMIN
6220
6240
Information extraction from product orders
INFO
6250
HISTORY
6230

Fig. 29

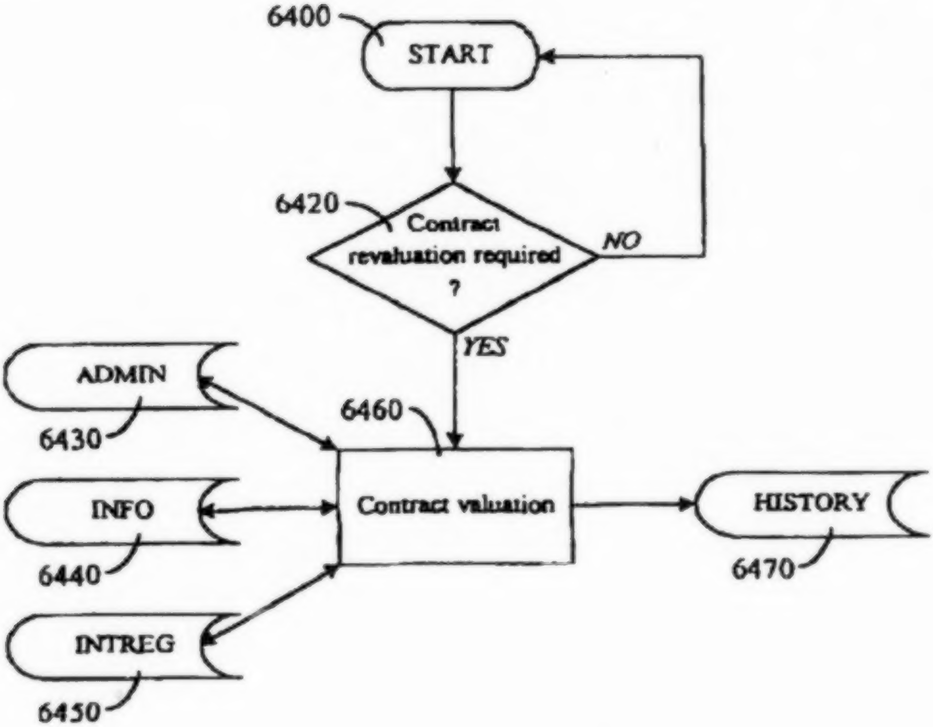

6400
START
6420
Contract revaluation required ?
NO
YES
ADMIN
6430
6460
INFO
6440
Contract valuation
HISTORY
6470
INTREG
6450

Fig. 30

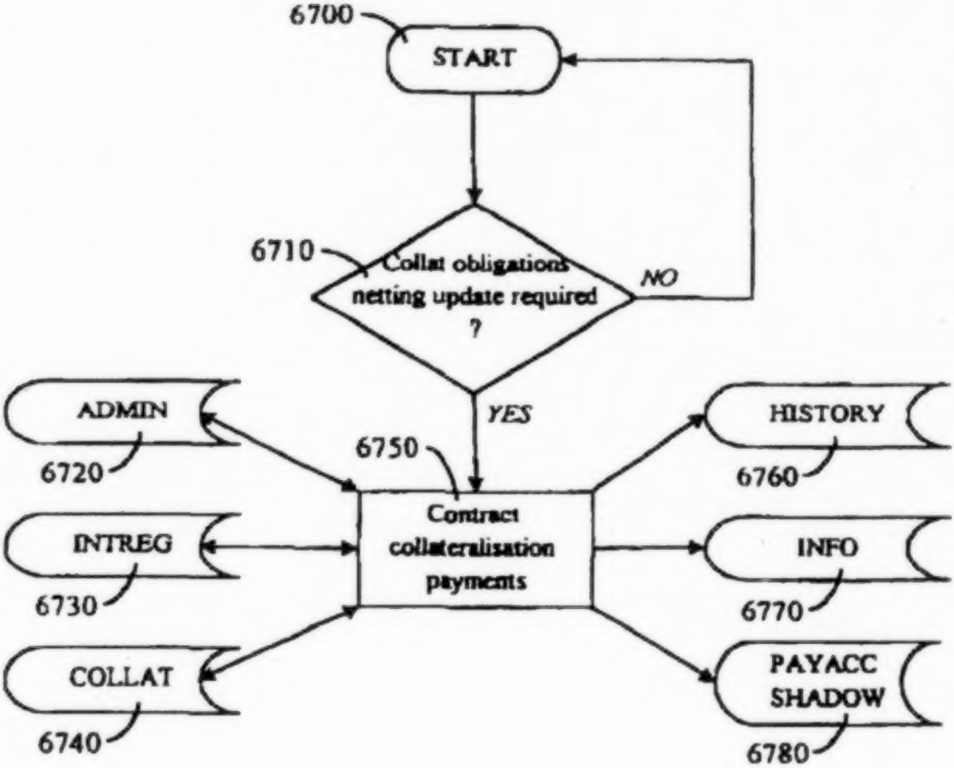

6700
START
6710
Collat obligations netting update required ?
NO
YES
ADMIN
6720
INTREG
6730
COLLAT
6740
6750
Contract collateralisation payments
HISTORY
6760
INFO
6770
PAYACC SHADOW
6780

Fig. 31

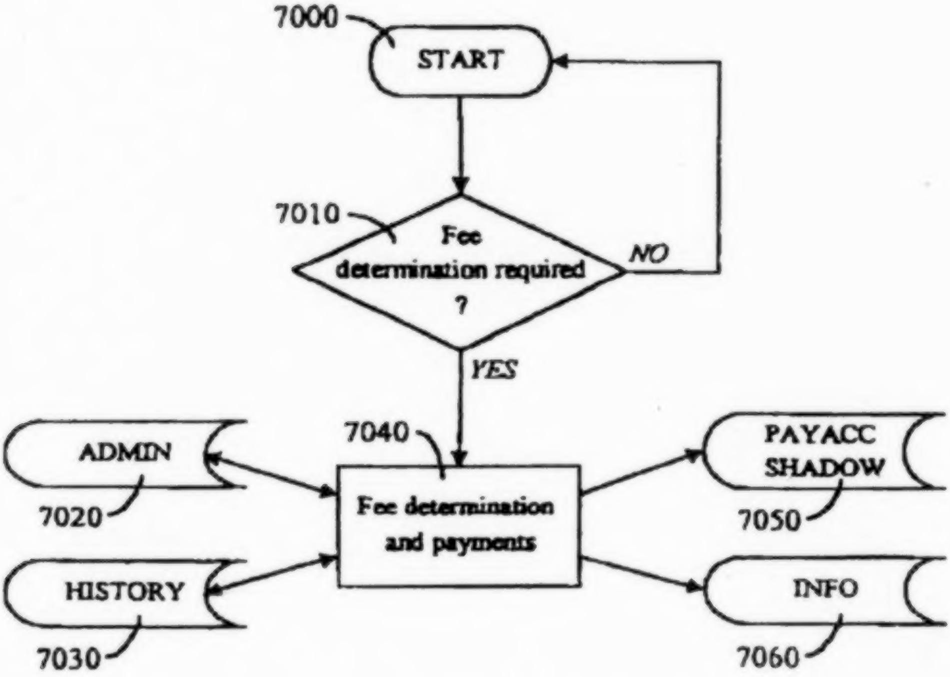

7000
START
7010
Fee determination required ?
NO
YES
7040
Fee determination and payments
ADMIN
7020
HISTORY
7030
PAYACC SHADOW
7050
INFO
7060

Fig. 32

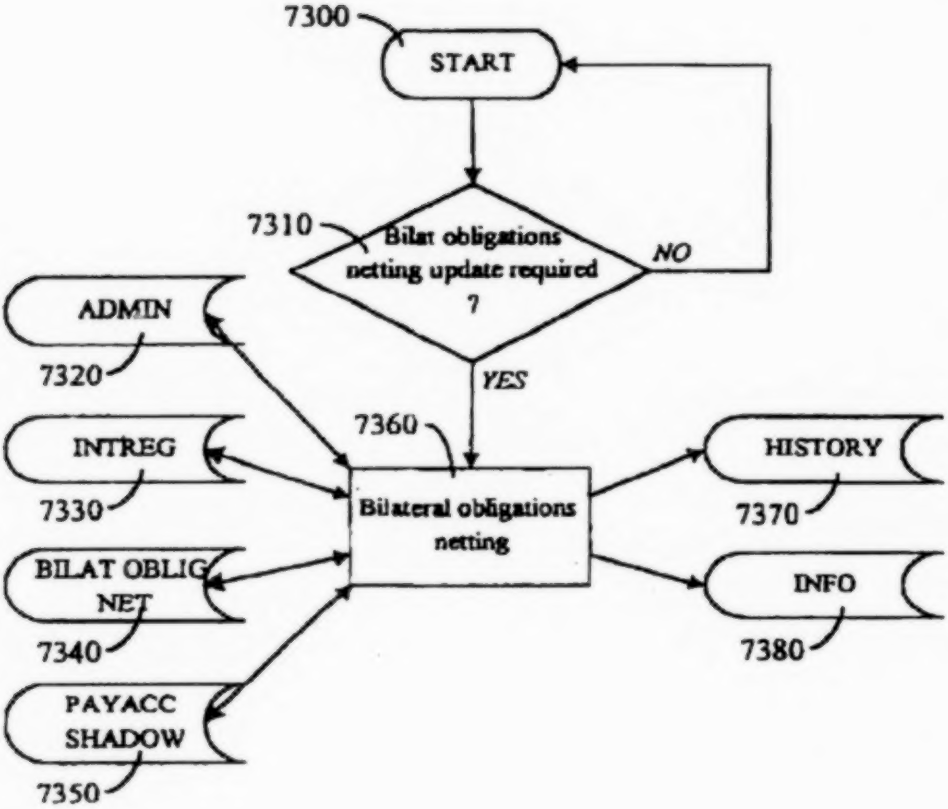

7300
START
7310
Bilat obligations netting update required ?
NO
YES
ADMIN
7320
INTREG
7330
BILAT OBLIG NET
7340
PAYACC SHADOW
7350
7360
Bilateral obligations netting
HISTORY
7370
INFO
7380

Fig. 33

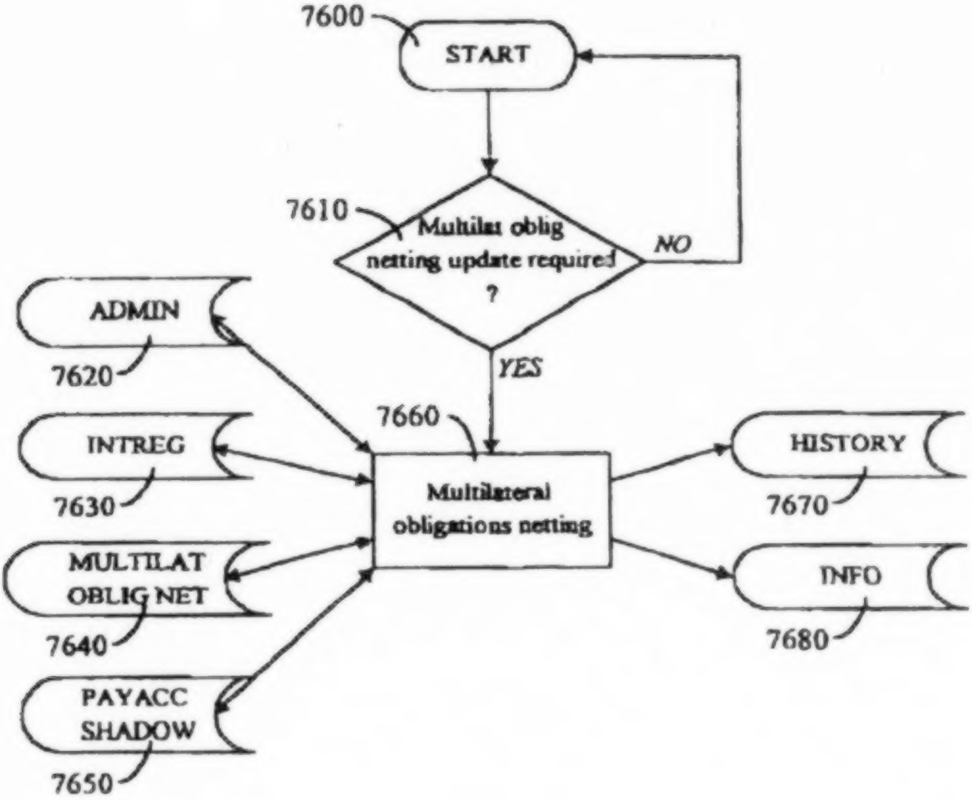

7600
START
7610
Multilat oblig netting update required ?
NO
YES
ADMIN
7620
INTREG
7630
MULTILAT OBLIG NET
7640
PAYACC SHADOW
7650
7660
Multilateral obligations netting
HISTORY
7670
INFO
7680

Fig. 34

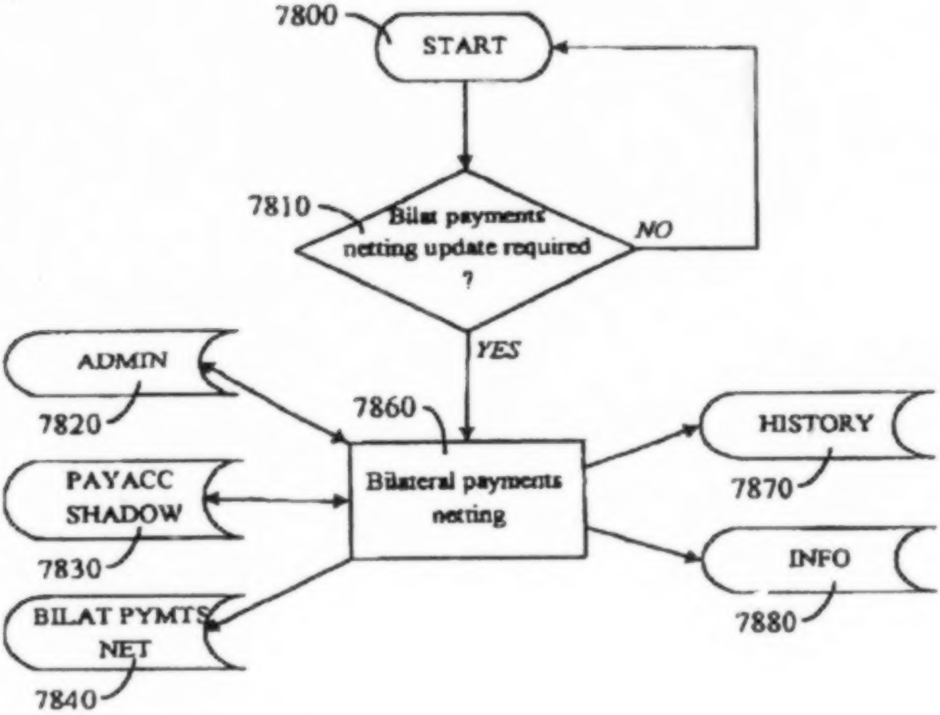

7800
START
7810
Bilat payments netting update required ?
NO
YES
ADMIN
7820
PAYACC SHADOW
7830
BILAT PYMTS NET
7840
7860
Bilateral payments netting
HISTORY
7870
INFO
7880

Fig. 35

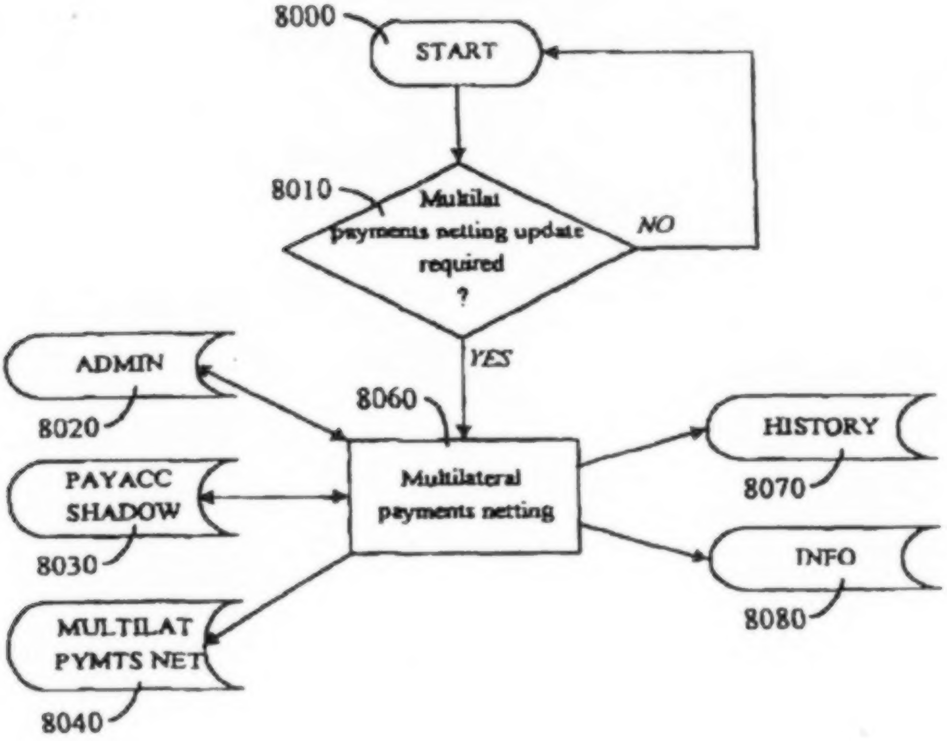

8000
START
8010
Multilat payments netting update required ?
NO
YES
ADMIN
8020
PAYACC SHADOW
8030
MULTILAT PYMTS NET
8040
8060
Multilateral payments netting
HISTORY
8070
INFO
8080

Fig. 36

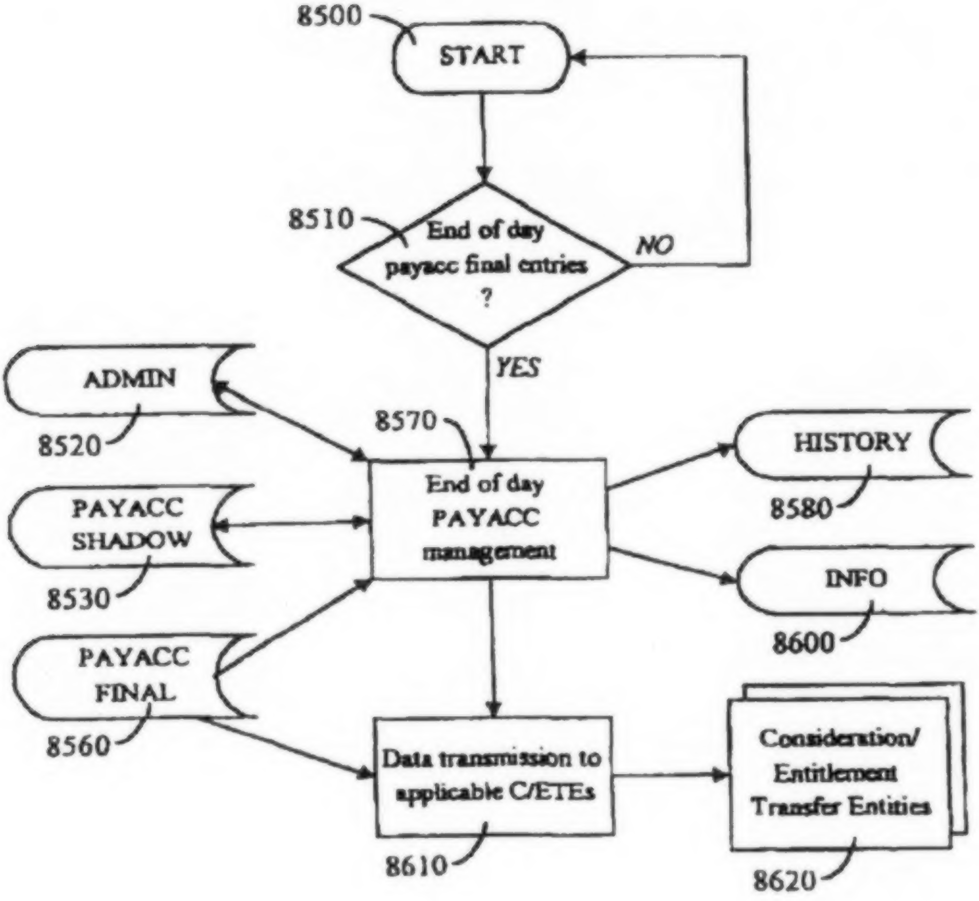

8500
START
8510
End of day payacc final entries ?
NO
YES
ADMIN
8520
8570
End of day PAYACC management
HISTORY
8580
PAYACC SHADOW
8530
INFO
8600
PAYACC FINAL
8560
Data transmission to applicable C/ETEs
8610
Consideration/ Entitlement Transfer Entities
8620

Fig. 37

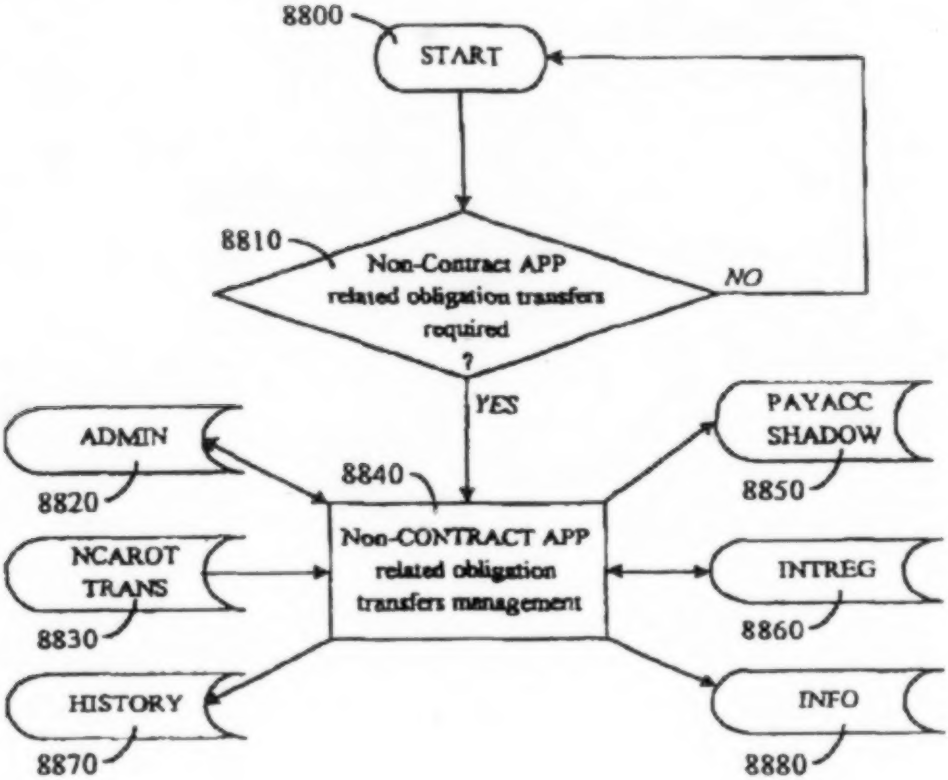

8800
START
8810
Non-Contract APP related obligation transfers required ?
NO
YES
ADMIN
8820
NCAROT TRANS
8830
HISTORY
8870
8840
Non-CONTRACT APP related obligation transfers management
PAYACC SHADOW
8850
INTREG
8860
INFO
8880

Fig. 38

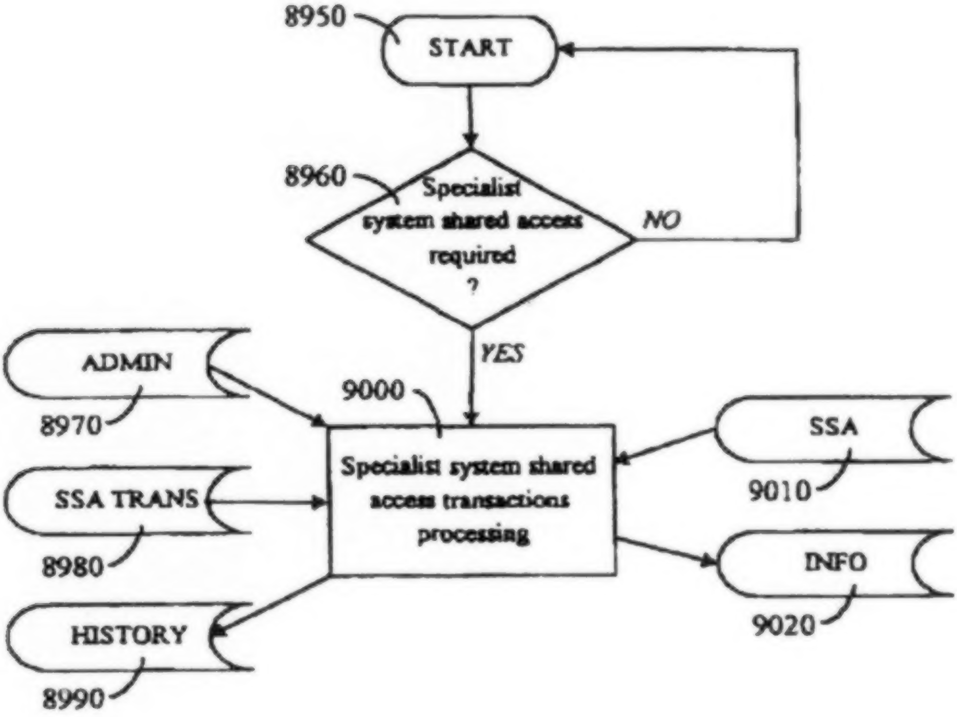

8950
START
8960
Specialist system shared access required ?
NO
YES
ADMIN
8970
9000
Specialist system shared access transactions processing
SSA TRANS
8980
HISTORY
8990
SSA
9010
INFO
9020

Fig. 39

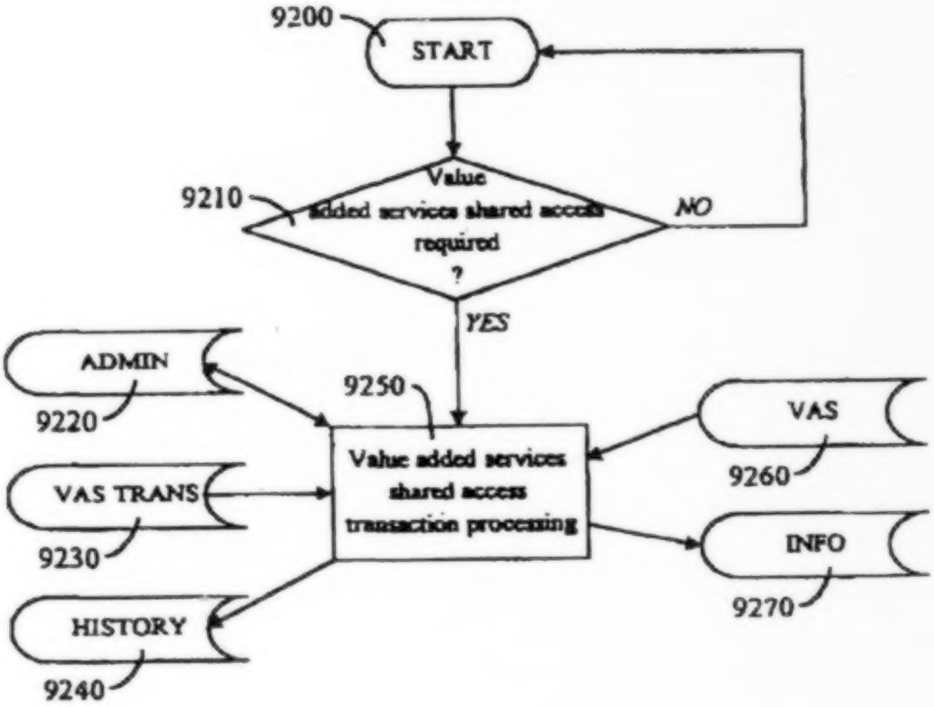
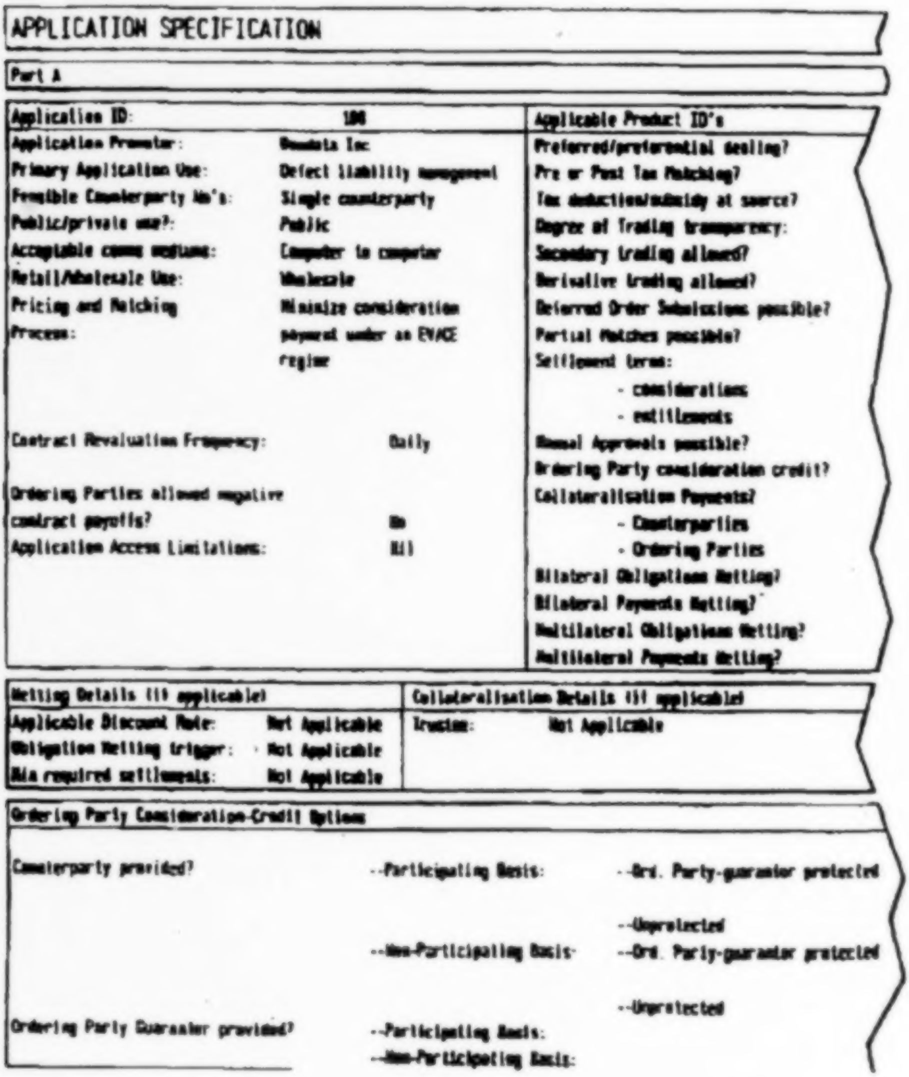

9200
START
9210
Value added services shared access required ?
NO
YES
ADMIN
9220
VAS TRANS
9230
HISTORY
9240
9250
Value added services shared access transaction processing
VAS
9260
INFO
9270

Fig. 40

FIG. 41



APPLICATION SPECIFICATION

Part A

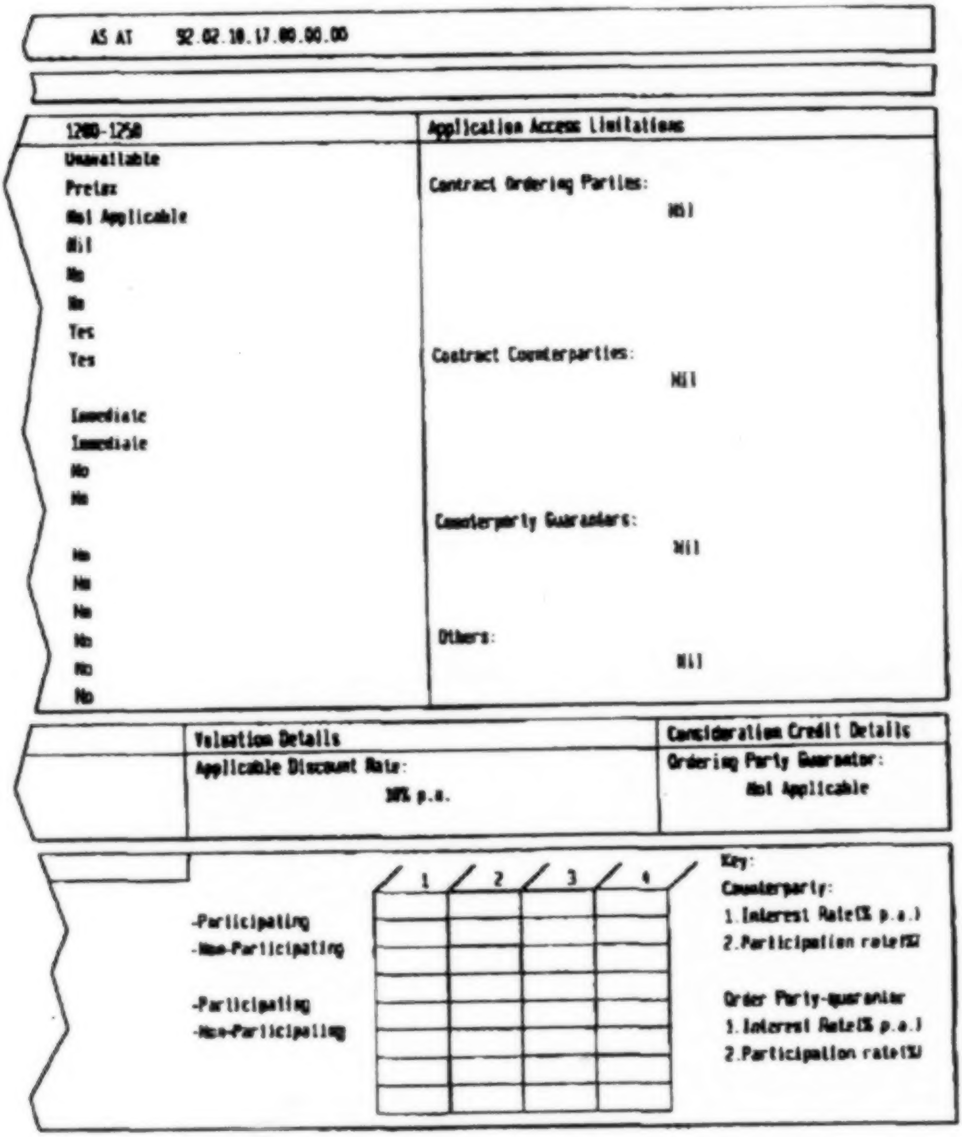
Application ID:	100	Applicable Product ID's
Application Promoter:	Goodata Inc	Preferred/preferential dealing?
Primary Application Use:	Defect liability management	Pre or Post Tax Matching?
Feasible Counterparty No's:	Single counterparty	Tax deduction/subsidy at source?
Public/private use?:	Public	Degree of Trading transparency:
Acceptable comms mediums:	Computer to computer	Secondary trading allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading allowed?
Pricing and Matching Process:	Minimize consideration payment under an EVACE regime	Deferred Order Submissions possible?
		Partial Matches possible?
		Settlement terms: - considerations - entitlements
Contract Revaluation Frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit?
Ordering Parties allowed negative contract payoffs?	No	Collateralisation Payments? - Counterparties - Ordering Parties
Application Access Limitations:	Nil	
		Bilateral Obligations Netting?
		Bilateral Payments Netting?
		Multilateral Obligations Netting?
		Multilateral Payments Netting?

Netting Details (if applicable)		Collateralisation Details (if applicable)	
Applicable Discount Rate:	Not Applicable	Trustee:	Not Applicable
Obligation Netting trigger:	Not Applicable		
Min required settlements:	Not Applicable		

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating Basis:	--Ord. Party-guarantor protected
		--Unprotected
	--Non-Participating Basis-	--Ord. Party-guarantor protected
		--Unprotected
Ordering Party Guarantor provided?	--Participating Basis:	
	--Non-Participating Basis:	

FIG. 41 CONT.



AS AT 92.02.10.17.00.00.00

1200-1250

Unavailable

Pretax

Not Applicable

Nil

No

No

Yes

Yes

Immediate

Immediate

No

No

No

No

No

No

No

No

Application Access Limitations

Contract Ordering Parties:
Nil

Contract Counterparties:
Nil

Counterparty Guarantors:
Nil

Others:
Nil

Valuation Details

Applicable Discount Rate:
10% p.a.

Consideration Credit Details

Ordering Party Guarantor:
Not Applicable

1 2 3 4

-Participating
-Non-Participating

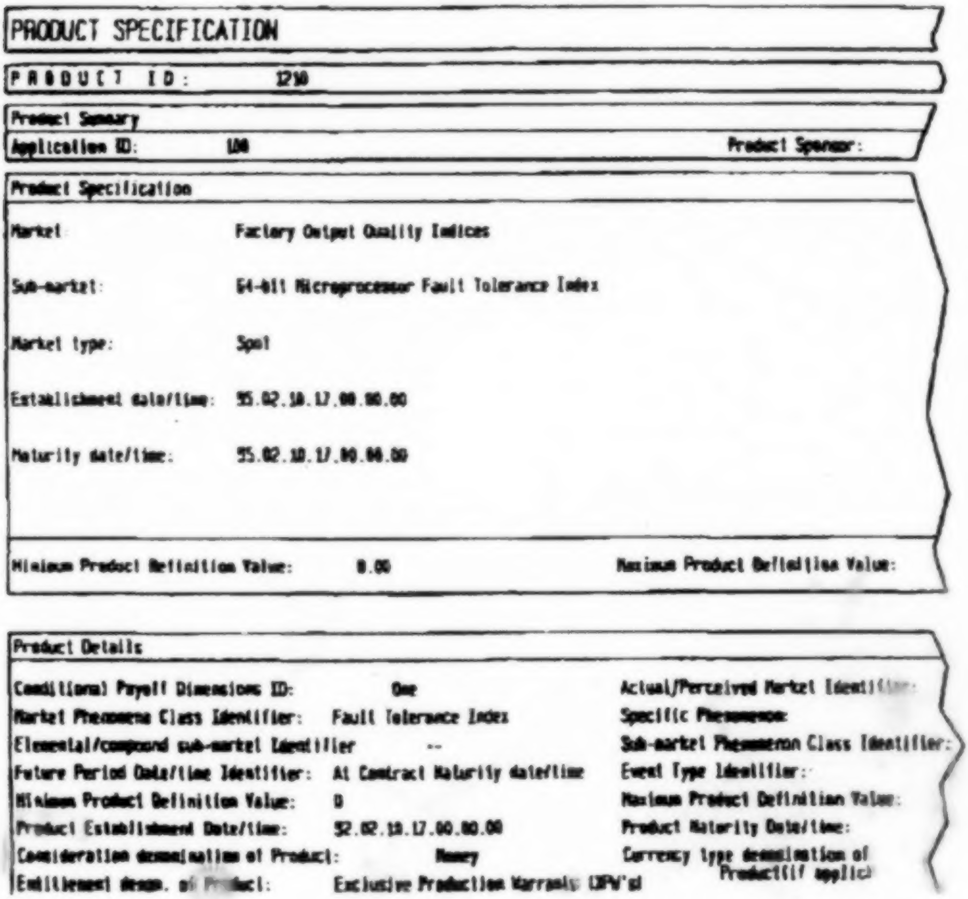
-Participating
-Non-Participating

Key:

Counterparty:
1. Interest Rate(% p.a.)
2. Participation rate(%)

Order Party-guarantor
1. Interest Rate(% p.a.)
2. Participation rate(%)

FIG. 42



PRODUCT SPECIFICATION

PRODUCT ID: 1230

Product Summary

Application ID: 100

Product Sponsor:

Product Specification

Market: Factory Output Quality Indices

Sub-market: 64-bit Microprocessor Fault Tolerance Index

Market type: Spot

Establishment date/time: 95.02.10.17.00.00.00

Maturity date/time: 95.02.10.17.00.00.00

Minimum Product Definition Value: 0.00

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Market Phenomena Class Identifier: Fault Tolerance Index

Elemental/compound sub-market Identifier --

Future Period Date/time Identifier: At Contract Maturity date/time

Minimum Product Definition Value: 0

Product Establishment Date/time: 92.02.10.17.00.00.00

Consideration denomination of Product: Money

Entitlement denom. of Product: Exclusive Production Warranty (EPW's)

Actual/Perceived Market Identifier:

Specific Phenomenon:

Sub-market Phenomenon Class Identifier:

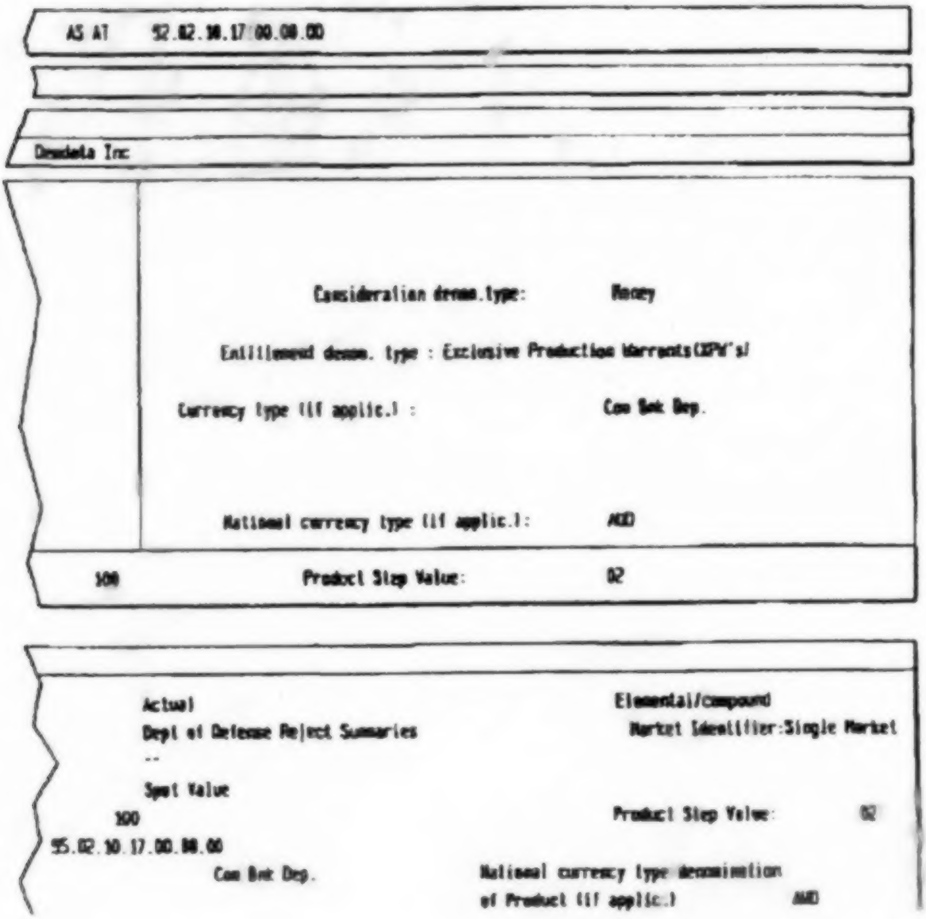
Event Type Identifier:

Maximum Product Definition Value:

Product Maturity Date/time:

Currency type denomination of Product(if applic

FIG. 42 CONT.



AS AT 95.02.10.17:00.00.00

Dendata Inc

Consideration denom. type: Money

Entitlement denom. type : Exclusive Production Warrants(XPW's)

Currency type (if applic.) : Con Bnk Dep.

National currency type (if applic.): AUD

100 Product Step Value: 02

Actual

Dept of Defense Reject Summaries

--

Spot Value

100

95.02.10.17.00.00.00

Con Bnk Dep.

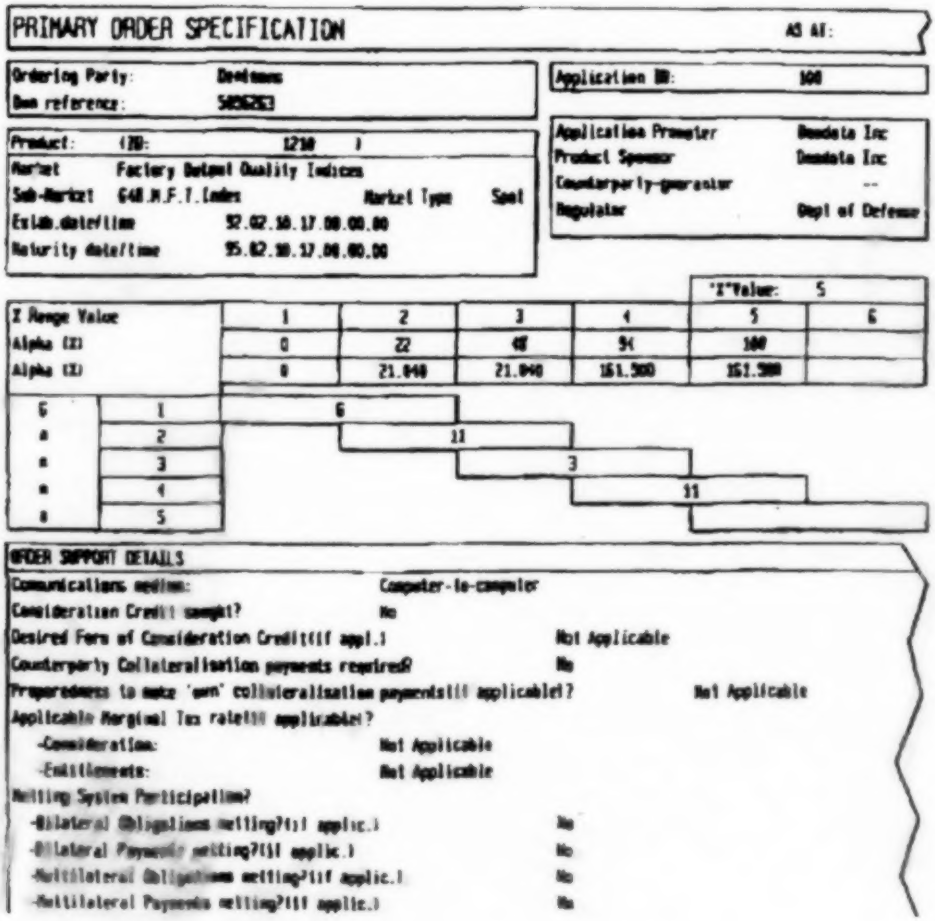
Elemental/compound

Market Identifier:Single Market

Product Step Value: 02

National currency type denomination of Product (if applic.) AUD

FIG. 43



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: Dealmaws
Own reference: 5056263

Application ID: 100

Product: (ID: 1210)
Market Factory Output Quality Indices
Sub-Market 648.M.F.T.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Application Promoter Deodata Inc
Product Sponsor Deodata Inc
Counterparty-guarantor --
Regulator Dept of Defense

"Z"Value: 5

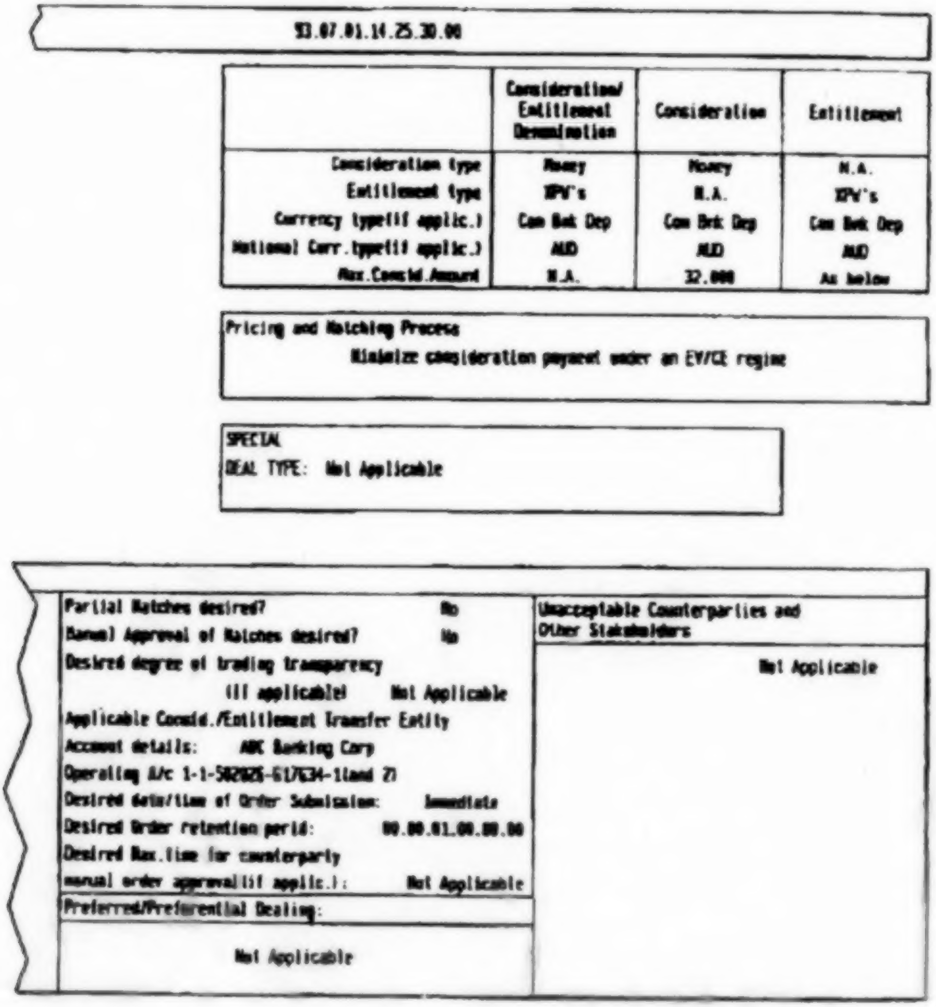
Z Range Value	1	2	3	4	5	6
Alpha (Z)	0	22	48	94	100	
Alpha (Z)	0	21.040	21.040	161.500	161.500	

G	1	6
a	2	11
m	3	3
m	4	11
a	5	

ORDER SUPPORT DETAILS

Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? No
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 43 CONT.



93.07.01.14.25.30.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Consideration type	Money	Money	N.A.
Entitlement type	XPV's	N.A.	XPV's
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	32.000	As below

Pricing and Matching Process

Minimize consideration payment under an EV/CE regime

SPECIAL
DEAL TYPE: Not Applicable

Partial Matches desired? No
Manual Approval of Matches desired? No
Desired degree of trading transparency
(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-502026-617634-1(and 2)
Desired date/time of Order Submission: Immediate
Desired Order retention perid: 00.00.01.00.00.00
Desired Max.time for counterparty
manual order approval(if applic.): Not Applicable

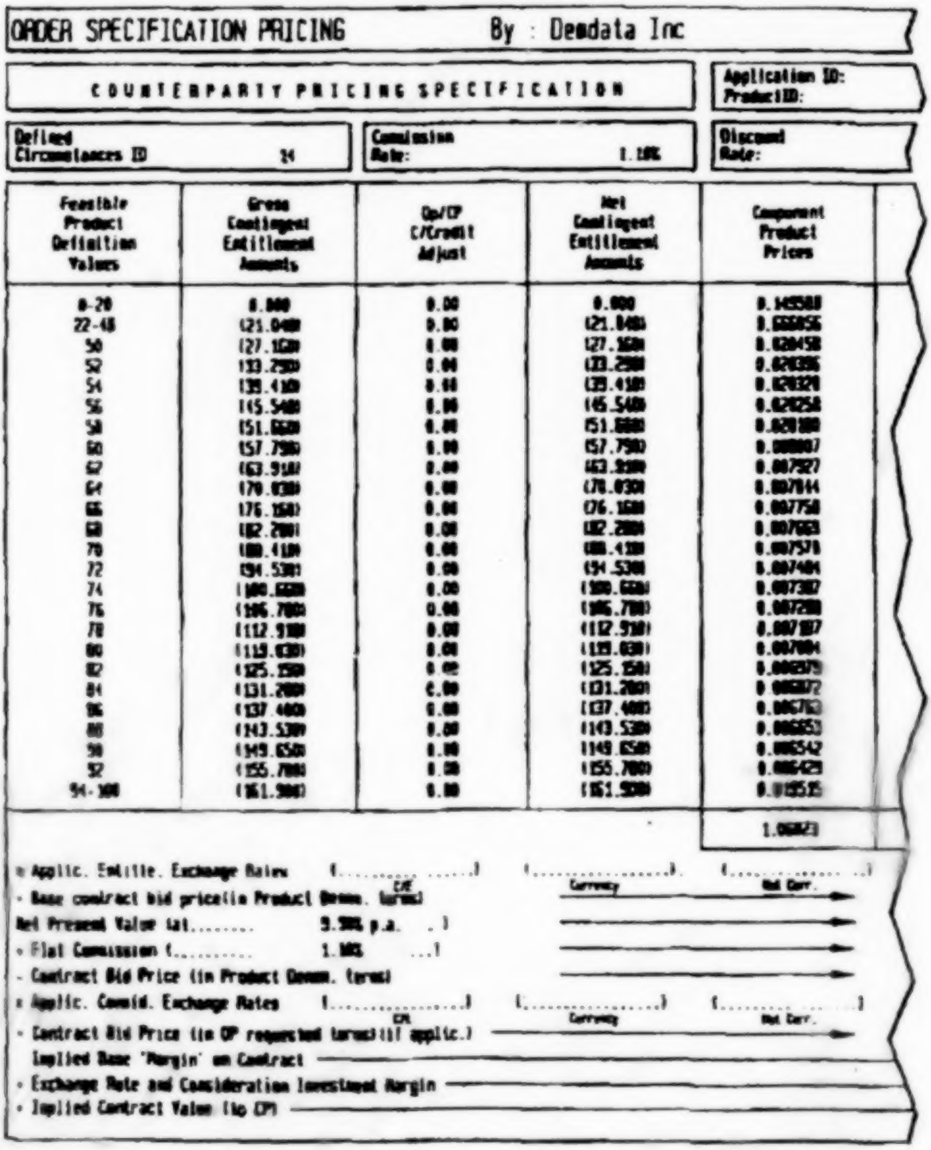
Preferred/Preferential Dealing:

Not Applicable

Unacceptable Counterparties and
Other Stakeholders

Not Applicable

FIG. 44



ORDER SPECIFICATION PRICING By : Deadata Inc

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID:

Defined Circumstances ID 34

Commission Rate: 1.10%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
0-20	0.000	0.00	0.000	0.145588
22-48	(21.040)	0.00	(21.040)	0.666056
50	(27.160)	0.00	(27.160)	0.020458
52	(33.290)	0.00	(33.290)	0.020396
54	(39.410)	0.00	(39.410)	0.020329
56	(45.540)	0.00	(45.540)	0.020258
58	(51.660)	0.00	(51.660)	0.020180
60	(57.790)	0.00	(57.790)	0.008007
62	(63.910)	0.00	(63.910)	0.007927
64	(70.030)	0.00	(70.030)	0.007844
66	(76.160)	0.00	(76.160)	0.007758
68	(82.280)	0.00	(82.280)	0.007669
70	(88.410)	0.00	(88.410)	0.007578
72	(94.530)	0.00	(94.530)	0.007484
74	(100.660)	0.00	(100.660)	0.007387
76	(106.780)	0.00	(106.780)	0.007288
78	(112.910)	0.00	(112.910)	0.007187
80	(119.030)	0.00	(119.030)	0.007084
82	(125.150)	0.00	(125.150)	0.006979
84	(131.280)	0.00	(131.280)	0.006872
86	(137.400)	0.00	(137.400)	0.006763
88	(143.530)	0.00	(143.530)	0.006653
90	(149.650)	0.00	(149.650)	0.006542
92	(155.780)	0.00	(155.780)	0.006429
94-100	(161.900)	0.00	(161.900)	0.019535
				1.06823

= Applic. Entitle. Exchange Rates (..................) (..................) (..................)

C/E Currency Nat Curr.

- Base contract bid price(in Product Denom. terms)

Net Present Value (at........ 9.90% p.a. .)

+ Flat Commission (.......... 1.10% ...)

- Contract Bid Price (in Product Denom. terms)

x Applic. Consid. Exchange Rates (..................) (..................) (..................)

C/R Currency Nat Curr.

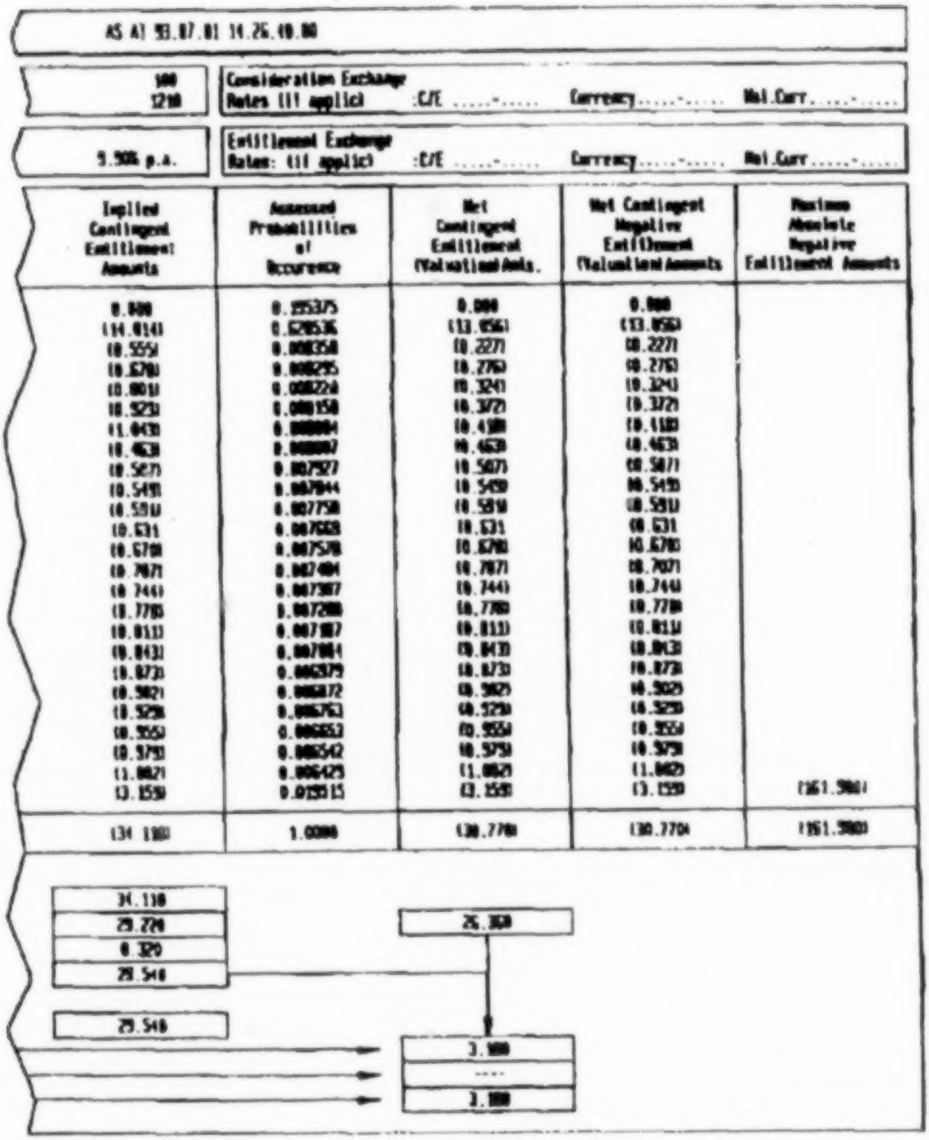
- Contract Bid Price (in OP requested terms)(if applic.)

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

+ Implied Contract Value (to CP)

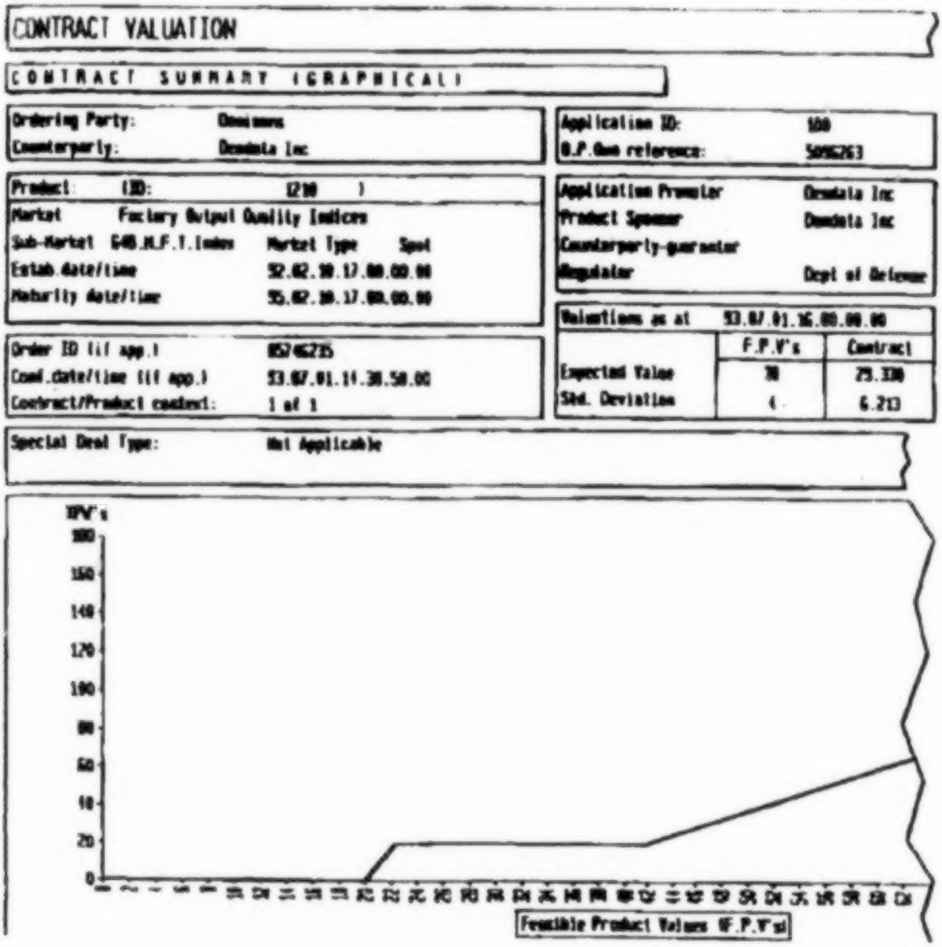
FIG. 44 CONT.


AS AT 93.07.01 14.26.40.00
100
1210
Consideration Exchange
Rates (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....
9.50% p.a.
Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....
34.110
29.224
0.320
28.540
29.540
25.360
3.100

3.100

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation Amts.	Net Contingent Negative Entitlement (Valuation Amounts	Maximum Absolute Negative Entitlement Amounts
0.000	0.155375	0.000	0.000	
(14.014)	0.620536	(13.056)	(13.056)	
(0.555)	0.008358	(0.227)	(0.227)	
(0.570)	0.008295	(0.276)	(0.276)	
(0.801)	0.008224	(0.324)	(0.324)	
(0.523)	0.008150	(0.372)	(0.372)	
(1.043)	0.008084	(0.418)	(0.418)	
(0.463)	0.008007	(0.463)	(0.463)	
(0.527)	0.007927	(0.507)	(0.507)	
(0.549)	0.007844	(0.549)	(0.549)	
(0.591)	0.007758	(0.591)	(0.591)	
(0.631)	0.007665	(0.631)	(0.631)	
(0.679)	0.007570	(0.670)	(0.670)	
(0.707)	0.007484	(0.707)	(0.707)	
(0.744)	0.007387	(0.744)	(0.744)	
(0.770)	0.007288	(0.780)	(0.770)	
(0.811)	0.007187	(0.811)	(0.811)	
(0.843)	0.007084	(0.843)	(0.843)	
(0.873)	0.006979	(0.873)	(0.873)	
(0.902)	0.006872	(0.902)	(0.902)	
(0.929)	0.006763	(0.929)	(0.929)	
(0.955)	0.006653	(0.955)	(0.955)	
(0.979)	0.006542	(0.975)	(0.979)	
(1.002)	0.006425	(1.002)	(1.002)	
(3.155)	0.019515	(3.158)	(3.159)	(161.580)
(34.110)	1.0000	(30.770)	(30.770)	(161.580)

FIG. 45



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	[illegible]
Counterparty:	Omnidata Inc

Application ID:	100
O.P.Own reference:	5096263

Product: (ID: 1210)

Market	Factory Output Quality Indices		
Sub-Market	G4B.M.F.T.Index	Market Type	Spot
Estab.date/time		92.02.10.17.00.00.00	
Maturity date/time		95.02.10.17.00.00.00	

Application Promoter	Omnidata Inc
Product Sponsor	Omnidata Inc
Counterparty-guarantor	
Regulator	Dept of Defense

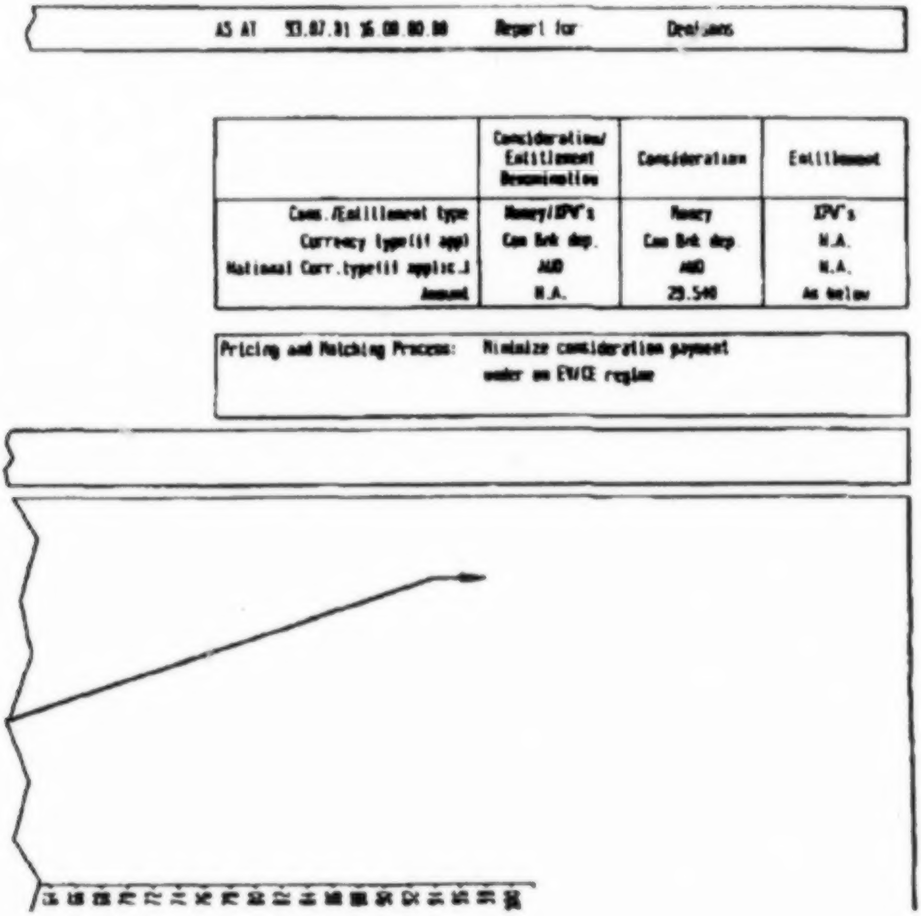
Order ID (if app.)	85746235
Conf.date/time (if app.)	93.07.01.14.38.50.00
Contract/Product context:	1 of 1

Valuations as at 93.07.01.16.00.00.00

	F.P.V's	Contract
Expected Value	30	25.330
Std. Deviation	4	6.213

Special Deal Type: Not Applicable

FIG. 45 CONT.

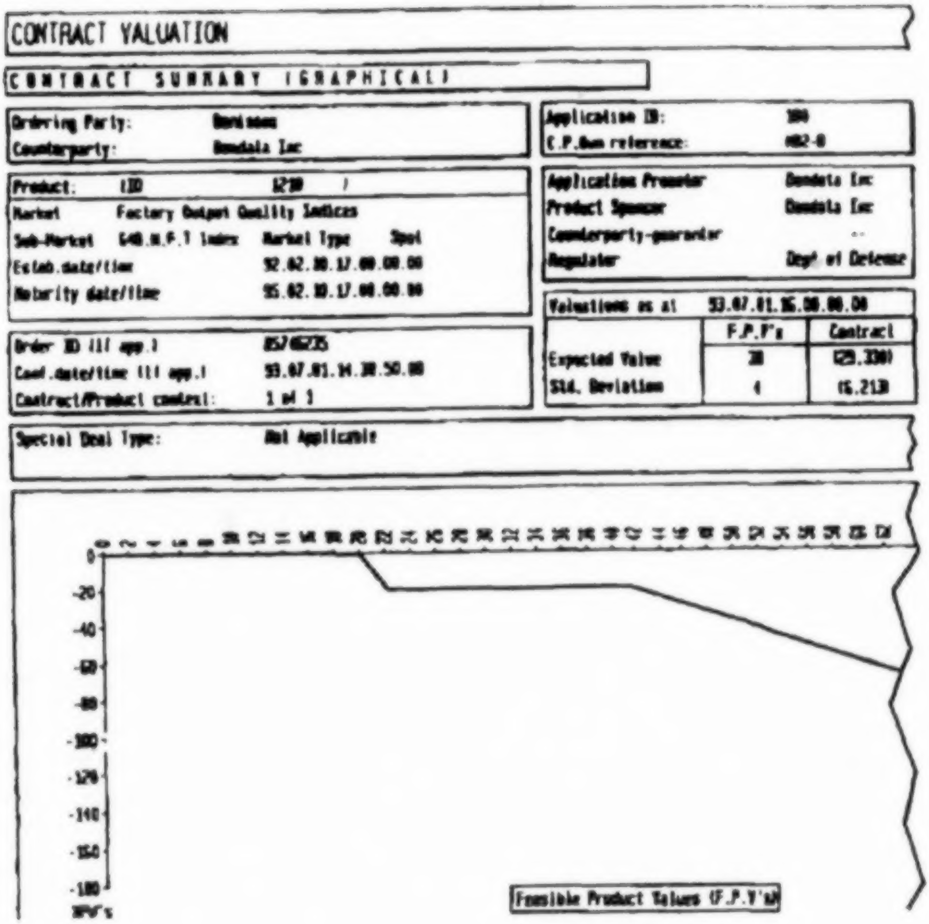


AS AT 53.07.31 16.00.00.00 Report for Dealers

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/IPV's	Money	IPV's
Currency type(if app)	Con Bnk dep.	Con Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	25.540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

FIG. 46



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Banksons
Counterparty:	Bondata Inc

Product:	(ID	1210	)
Market	Factory Output Quality Indices		
Sub-Market	640.H.F.1 Index	Market Type	Spot
Estab.date/time		92.02.10.17.00.00.00	
Maturity date/time		95.02.10.17.00.00.00	

Order ID (if app.)	85746235
Conf.date/time (if app.)	93.07.01.14.30.50.00
Contract/Product control:	1 of 1

Application ID:	190
C.P.Own reference:	402-0

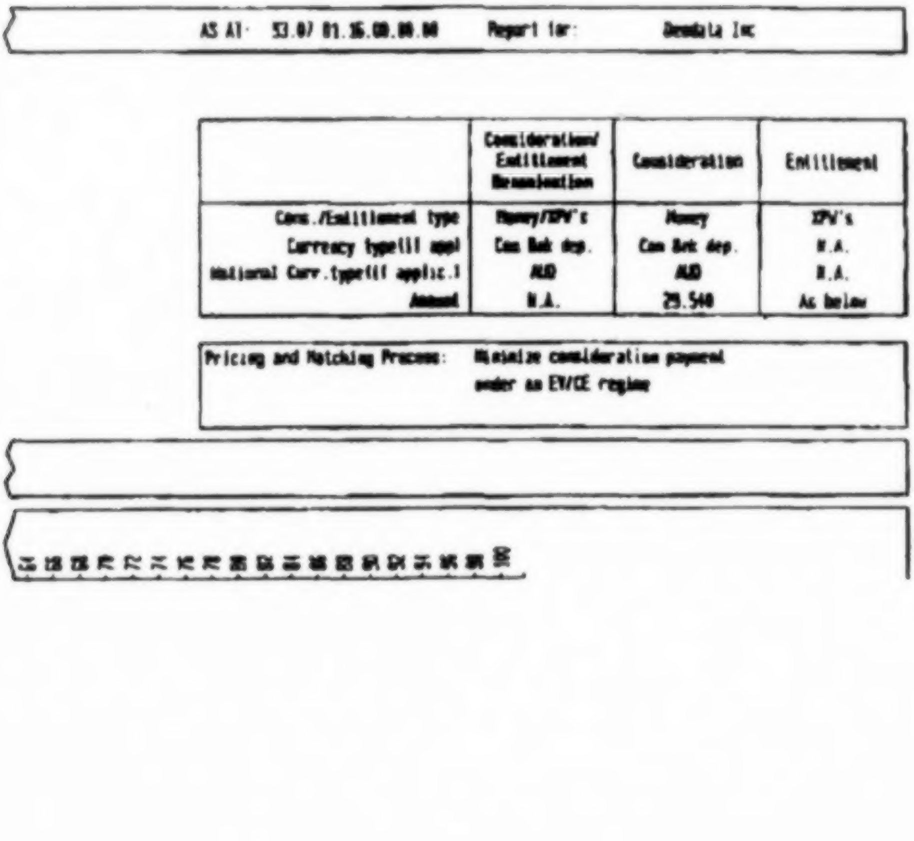
Application Promoter	Bondata Inc
Product Sponsor	Bondata Inc
Counterparty-guarantor	--
Regulator	Dep't of Defense

Valuations as at 93.07.01.15.00.00.00

	F.P.V's	Contract
Expected Value	30	(29.330)
Std. Deviation	4	(6.213)

Special Deal Type:	Not Applicable

FIG. 46 CONT.

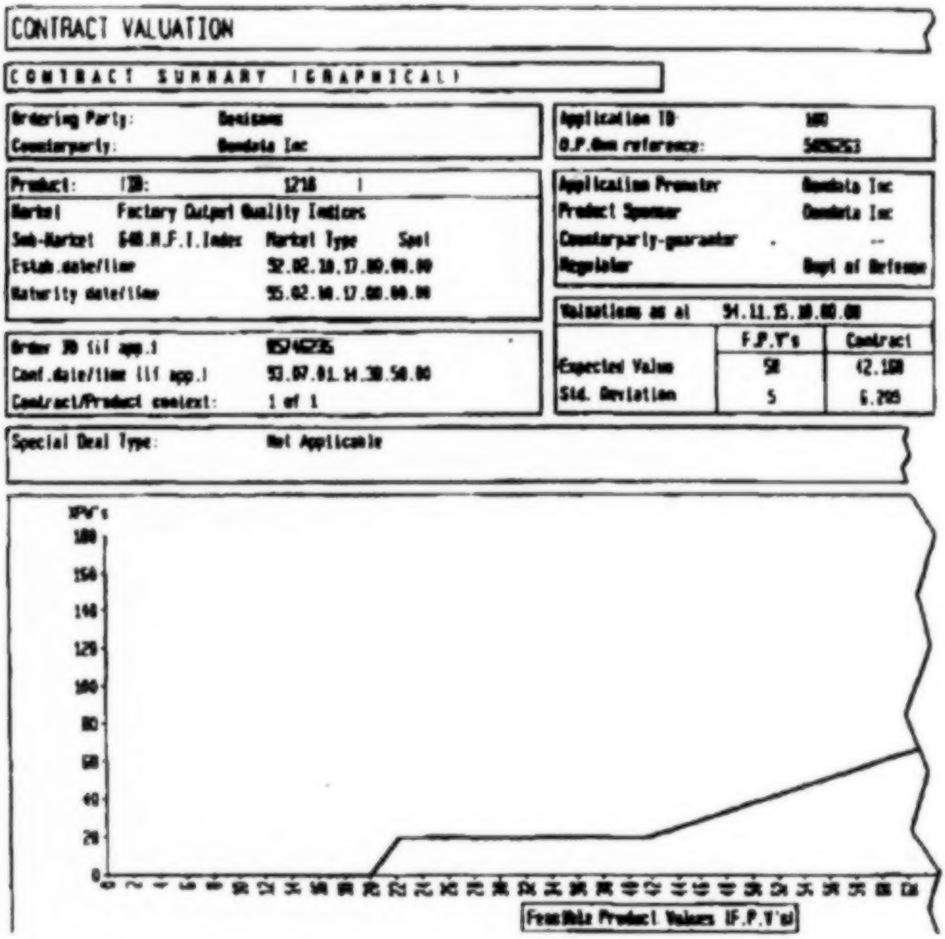


AS AT: 53.07 01.16.00.00.00 Report for: Deedata Inc

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/XPV's	Money	XPV's
Currency type(if appl	Con Bnk dep.	Con Bnk dep.	N.A.
Additional Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	29.540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

FIG. 47



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Denisons
Counterparty: Dendata Inc

Product: (ID: 1218)
Market Factory Output Quality Indices
Sub-Market 640.M.F.I.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Order ID (if app.) 85746235
Conf.date/time (if app.) 93.07.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID 100
O.P.Own reference: 5856253

Application Promoter Dendata Inc
Product Sponsor Dendata Inc
Counterparty-guarantor --
Regulator Dept of Defense

Valuations as at 94.11.15.10.00.00

	F.P.V's	Contract
Expected Value	58	42.180
Std. Deviation	5	6.205

Special Deal Type: Not Applicable

FIG. 47 CONT.

AS AT. 94.11.15.10.00.00.00 Report for: Denisons

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/XPV's	Money	XPV's
Currency type(if app)	Con Bnk dep.	Con Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	29,540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

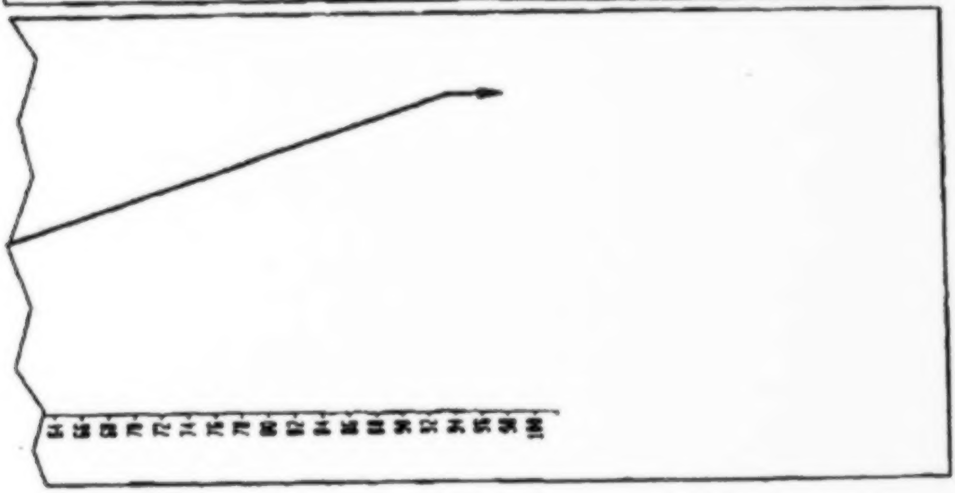
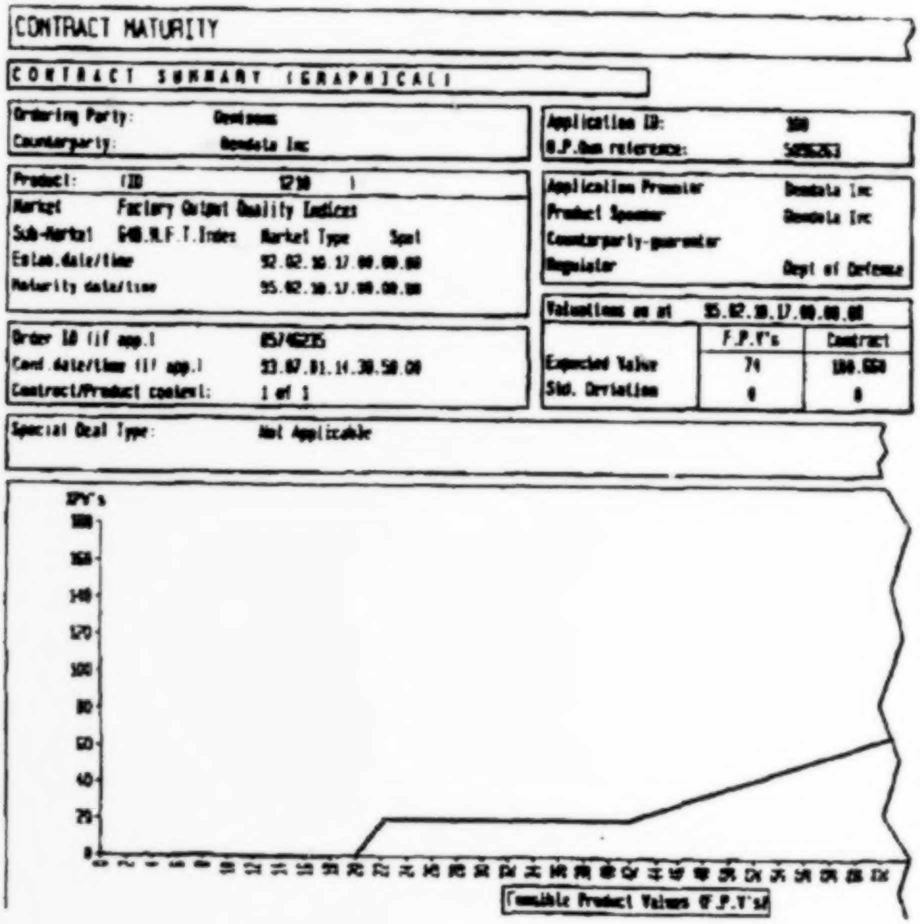


FIG. 48



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: [illegible]
Counterparty: Dendata Inc

Product: (ID 1210)
Market Factory Output Quality Indices
Sub-Market 640.N.F.T.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Order ID (if app.) 05/46235
Conf date/time (if app.) 93.07.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 100
O.P.Own reference: 5056253

Application Promoter Dendata Inc
Product Sponsor Dendata Inc
Counterparty-guarantor
Regulator Dept of Defense

Valuations as at 95.02.10.17.00.00.00

	F.P.V's	Contract
Expected Value	74	100.000
Std. Deviation	0	0

Special Deal Type: Not Applicable

FIG. 4B CONT.

AS AT: 95.02.10.17.00.00.00 Report for: Denisons

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/IPV's	Money	IPV's
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	29.540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

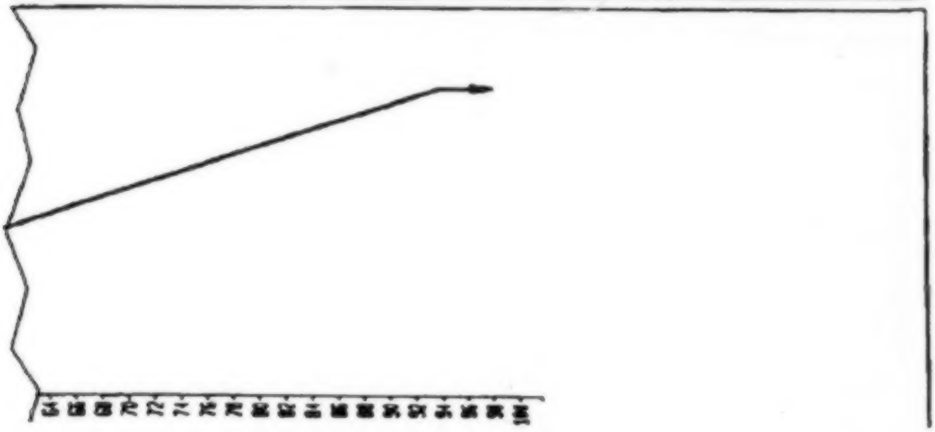


FIG. 49

APPLICATION SPECIFICATION

Part A

Application ID:	001
Application Promoter:	Nevcon Inc
Primary Application Use:	Hardware capacity management
Feasible Counterparty No's:	Multiple counterparties
Public/private use?:	Private
Acceptable comms mediums:	Computer to computer
Retail/Wholesale Use:	Wholesale
Pricing and Matching Process:	Minimize consideration payment under an EV/CE regime
Contract Revaluation Frequency:	Daily
Ordering Parties allowed negative contract payoffs?	Yes
Application Access Limitations:	Nil

Applicable Product ID's

Preferred/preferential dealing?
Pre or Post Tax Matching?
Tax deduction/subsidy at source?
Degree of trading transparency:
Secondary trading allowed?
Derivative trading allowed?
Deferred Order Submissions possible?
Partial Matches possible?
Settlement terms:
- considerations
- entitlements

Manual Approvals possible?
Ordering Party consideration credit?
Collateralisation Payments?.
- Counterparties
- Ordering Parties

Bilateral Obligations Netting?
Bilateral Payments Netting?
Multilateral Obligations Netting?
Multilateral Payments Netting?

Netting Details (if applicable)

Applicable Discount Rate:	Not applicable
Obligation Netting trigger:	Not applicable
Min required settlements:	Not applicable

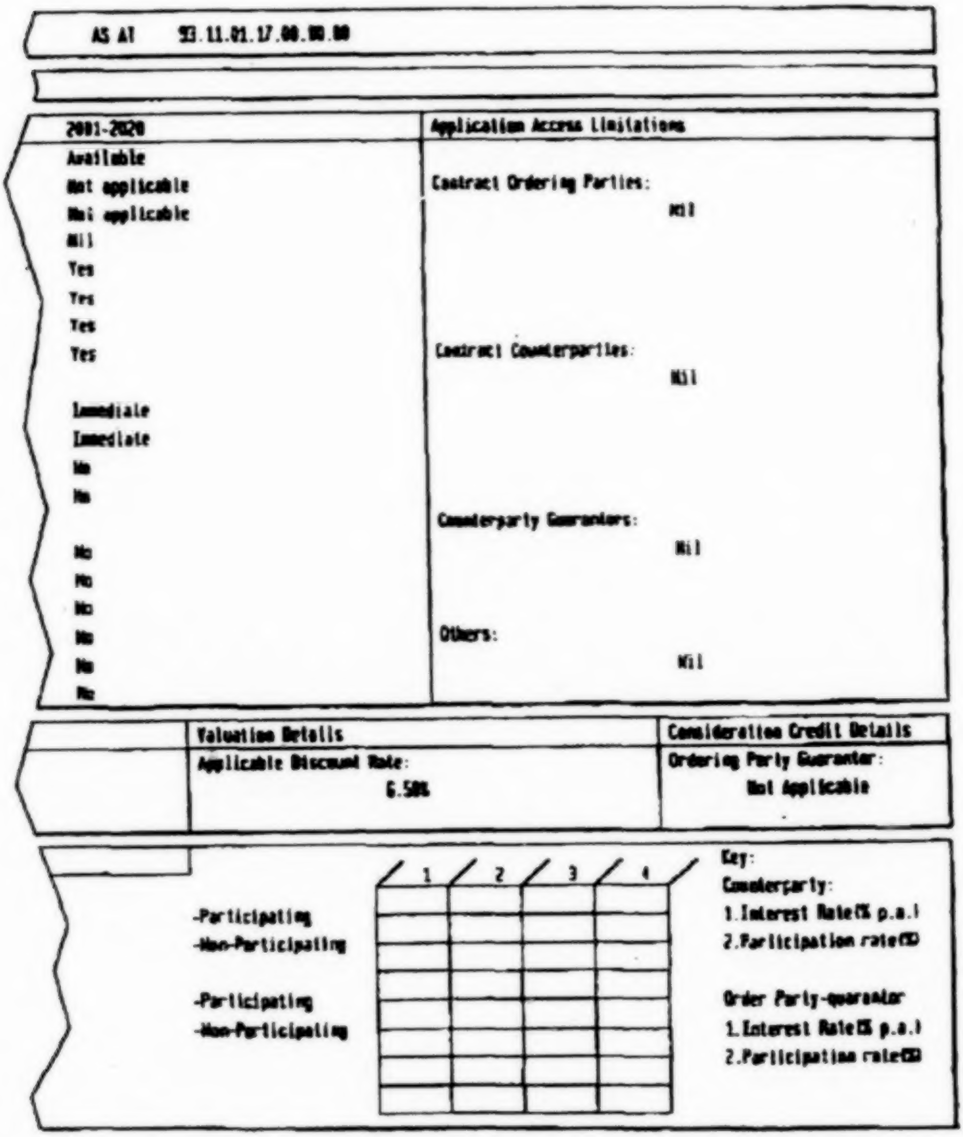
Collateralisation Details (if applicable)

Trustee: Not Applicable

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating Basis:	--Ord.Party-guarantor protected
		--Unprotected
	--Non-Participating basis:	--Ord.Party-guarantor protected
		--Unprotected
Ordering Party Guarantor provided?	--Participating basis:	
	--Non-Participating basis:	

FIG. 49 CONT.



AS AT 93.11.01.17.00.00.00

2001-2020

Available
Not applicable
Not applicable
Nil
Yes
Yes
Yes
Yes

Immediate
Immediate
No
No

No
No
No
No
No
No

Application Access Limitations

Contract Ordering Parties:
Nil

Contract Counterparties:
Nil

Counterparty Guarantors:
Nil

Others:
Nil

Valuation Details

Applicable Discount Rate:
6.50%

Consideration Credit Details

Ordering Party Guarantor:
Not Applicable

1 2 3 4

-Participating
-Non-Participating

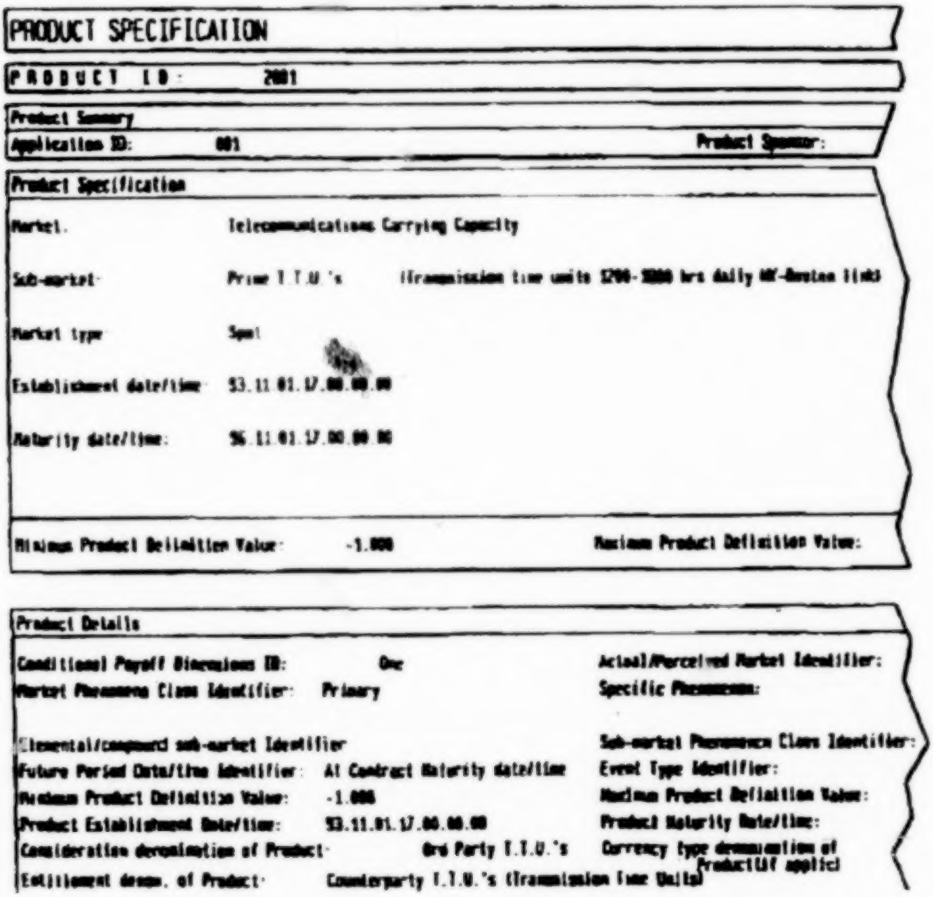
-Participating
-Non-Participating

Key:

Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Order Party-guarantor
1.Interest Rate(% p.a.)
2.Participation rate(%)

FIG. 50



PRODUCT SPECIFICATION

PRODUCT ID: 2001

Product Summary

Application ID: 001 Product Sponsor:

Product Specification

Market: Telecommunications Carrying Capacity

Sub-market: Prime T.T.U.'s (Transmission time units 1200-1800 hrs daily NY-Boston link)

Market type: Spot

Establishment date/time: 93.11.01.17.00.00.00

Maturity date/time: 96.11.01.17.00.00.00

Minimum Product Definition Value: -1.000 Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One Actual/Perceived Market Identifier:

Market Phenomena Class Identifier: Primary Specific Phenomenon:

Elemental/compound sub-market Identifier Sub-market Phenomenon Class Identifier:

Future Period Date/time Identifier: At Contract Maturity date/time Event Type Identifier:

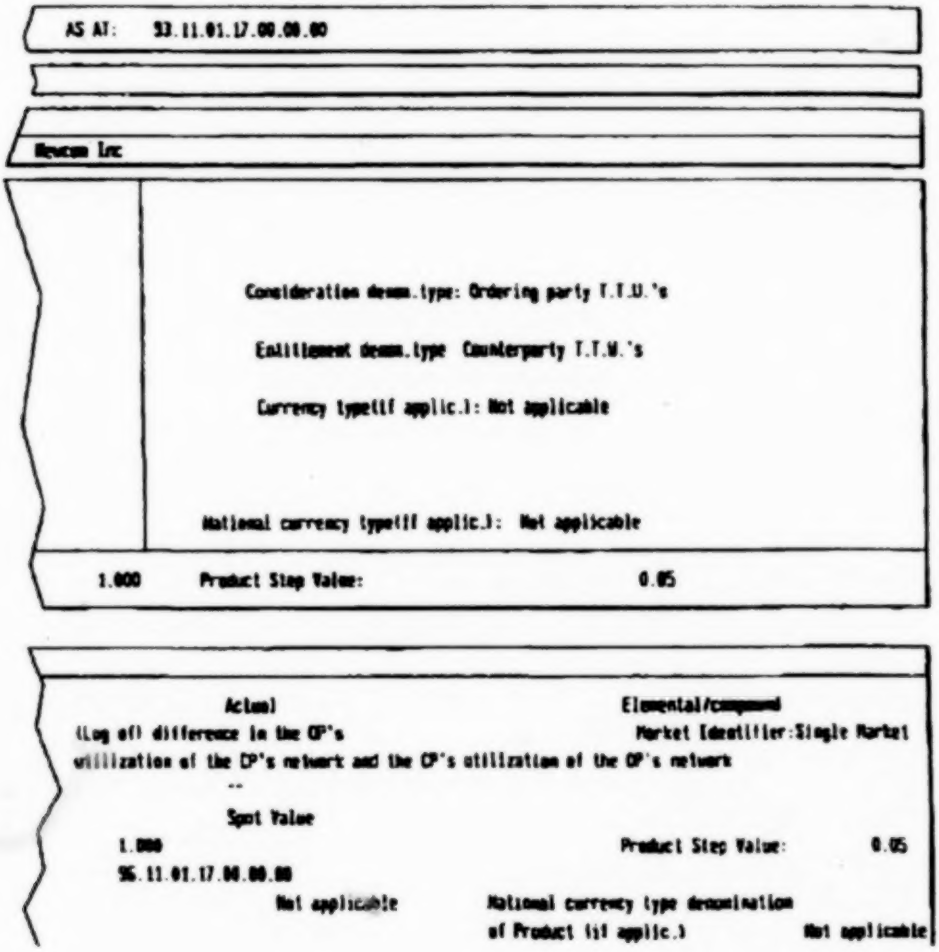
Minimum Product Definition Value: -1.000 Maximum Product Definition Value:

Product Establishment Date/time: 93.11.01.17.00.00.00 Product Maturity Date/time:

Consideration denomination of Product: 3rd Party T.T.U.'s Currency type denomination of Product(if applic)

Entitlement denom. of Product: Counterparty T.T.U.'s (Transmission Time Units)

FIG. 50 CONT.



AS AT: 93.11.01.17.00.00.00

Newcom Inc

Consideration denom.type: Ordering party T.T.U.'s

Entitlement denom.type Counterparty T.T.U.'s

Currency type(if applic.): Not applicable

National currency type(if applic.): Not applicable

1.000 Product Step Value: 0.05

Actual

Elemental/compound

(Log of) difference in the OP's utilization of the CP's network and the CP's utilization of the OP's network

Market Identifier:Single Market

--

Spot Value

1.000

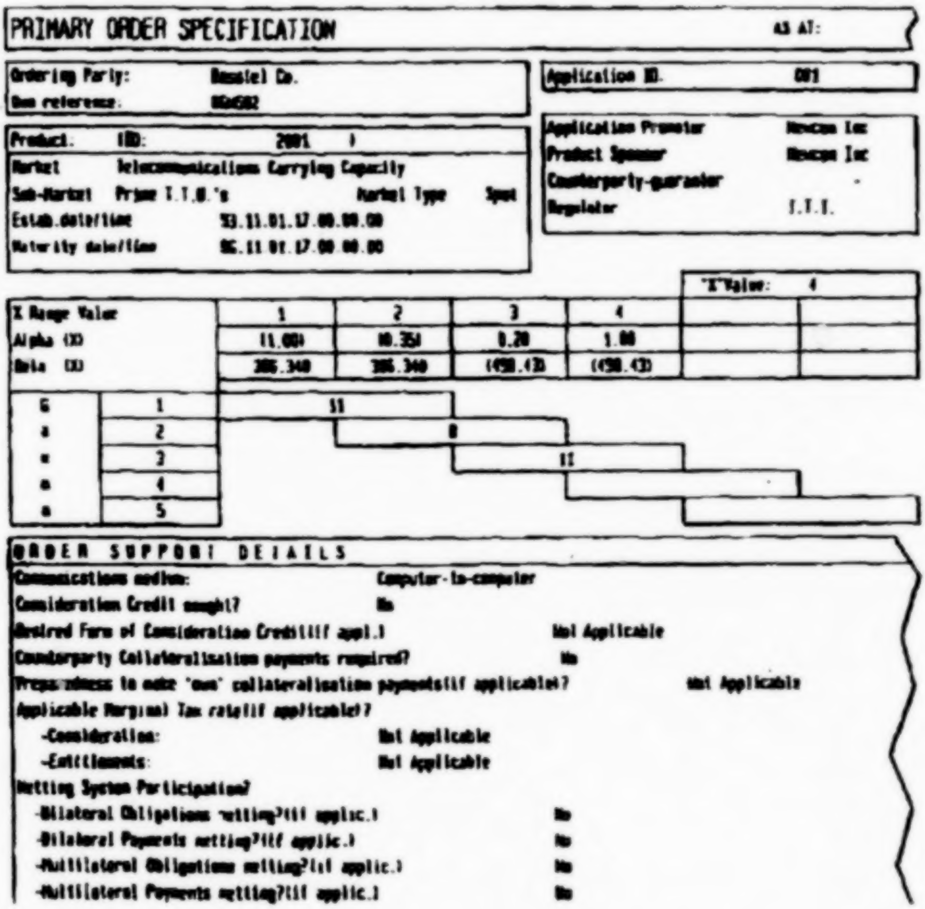
Product Step Value: 0.05

95.11.01.17.00.00.00

Not applicable

National currency type denomination of Product (if applic.) Not applicable

FIG. 51



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: Besstel Co.
Own reference: BG4582

Application ID. 001

Product. (ID: 2001)
Market Telecommunications Carrying Capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 53.11.01.17.00.00.00
Maturity date/time 56.11.01.17.00.00.00

Application Promoter Nexcom Inc
Product Sponsor Nexcom Inc
Counterparty-guarantor -
Regulator I.T.I.

"X"Value: 4

X Range Value		1	2	3	4		
Alpha (%)		(1.00)	(0.35)	0.20	1.00		
Beta (%)		385.340	385.340	(458.43)	(458.43)		
G	1	11					
a	2		0				
m	3			11			
m	4						
a	5						

ORDER SUPPORT DETAILS

Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? No
Preparedness to make "own" collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 51 CONT.

94.06.01.14.25.30.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Consideration type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if applic.)	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Max.Consid.Amount	N.A.	50.000	As below

Pricing and Matching Process:
Minimize consideration payment under an EV/CE regime

SPECIAL DEAL TYPE: Ordering party negative entitlement allowed.

Partial Matches desired? No
Manual Approval of Matches desired? No
Desired degree of trading transparency (if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-582025-345895-0
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.0
Desired Max.time for counterparty manual order approval(if applic.): Not Applicable

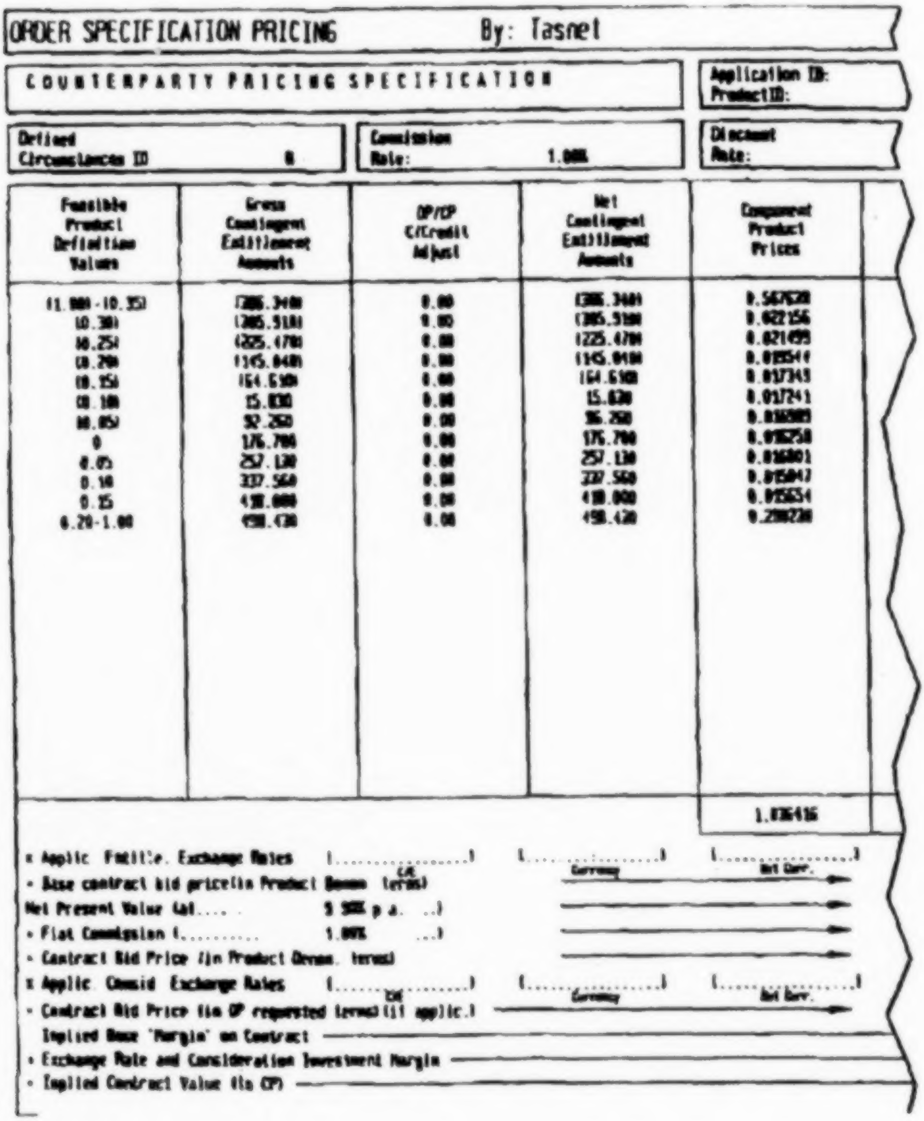
Preferred/Preferential Dealing:

Nil

Unacceptable Counterparties and Other Stakeholders

Not Applicable

FIG. 52



ORDER SPECIFICATION PRICING By: Tasnet

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID 8

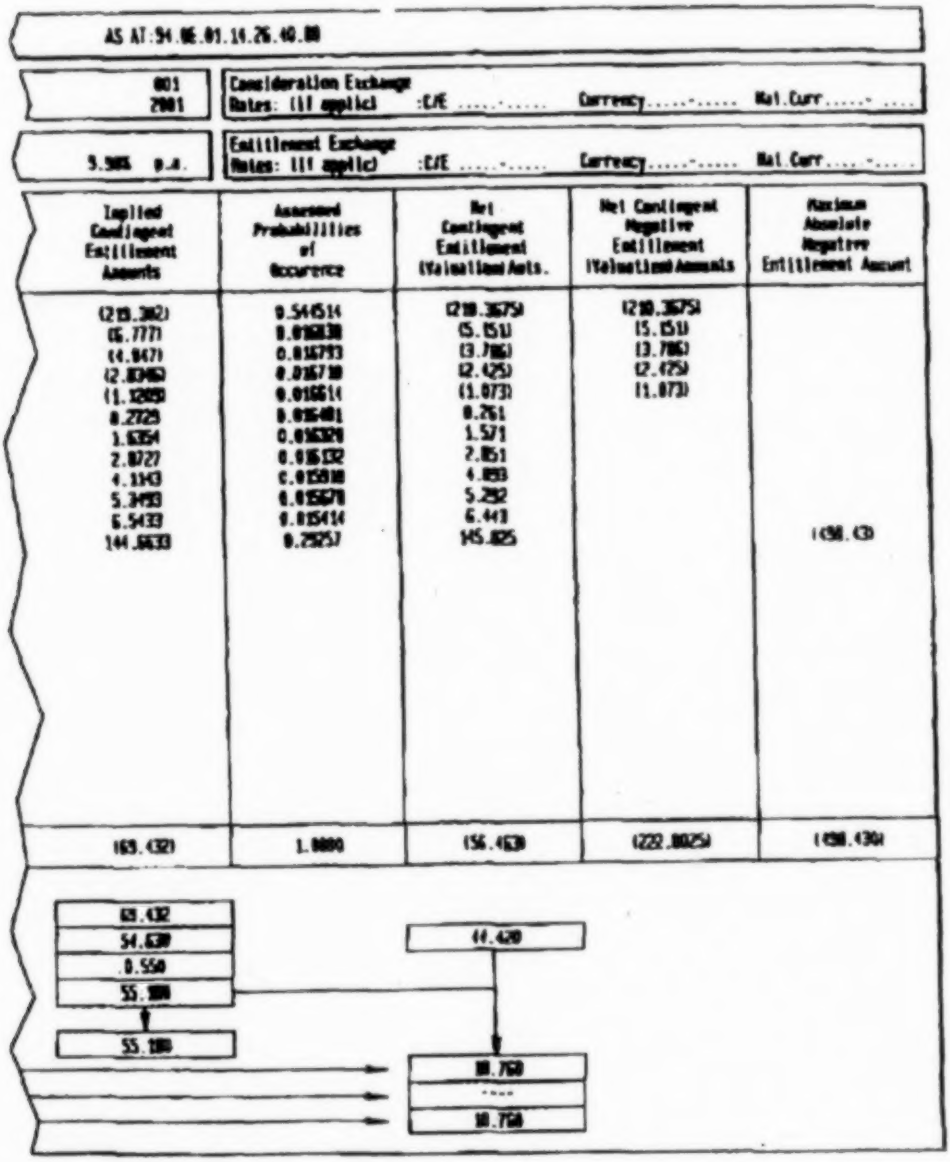
Commission Rate: 1.00%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	DP/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
(1.000-10.35)	(205.340)	0.00	(205.340)	0.567520
(0.30)	(205.510)	0.00	(205.510)	0.022156
(0.25)	(225.470)	0.00	(225.470)	0.021495
(0.20)	(145.040)	0.00	(145.040)	0.019544
(0.15)	(64.510)	0.00	(64.510)	0.017343
(0.10)	15.830	0.00	15.830	0.017241
(0.05)	92.250	0.00	96.250	0.016985
0	176.700	0.00	175.700	0.016250
0.05	257.130	0.00	257.130	0.016001
0.10	337.560	0.00	337.560	0.015047
0.15	418.000	0.00	418.000	0.015654
0.20-1.00	498.420	0.00	498.420	0.280230
				1.036416

x Applic. Facil'e. Exchange Rates (..................) (..................) (..................)
C/E Currency Ret Curr.
= Base contract bid price (in Product Denom. terms) ⟶
Net Present Value (at.... 5.50% p.a. ...) ⟶
+ Flat Commission (.......... 1.00% ...) ⟶
= Contract Bid Price (in Product Denom. terms) ⟶
x Applic. Consid. Exchange Rates (..................) (..................) (..................)
C/E Currency Ret Curr.
= Contract Bid Price (in CP requested terms) (if applic.) ⟶
Implied Base 'Margin' on Contract ——
+ Exchange Rate and Consideration Investment Margin ——
= Implied Contract Value (to CP) ——

FIG. 52 CONT.



AS AT:94.06.01.14.26.40.00

001
2001

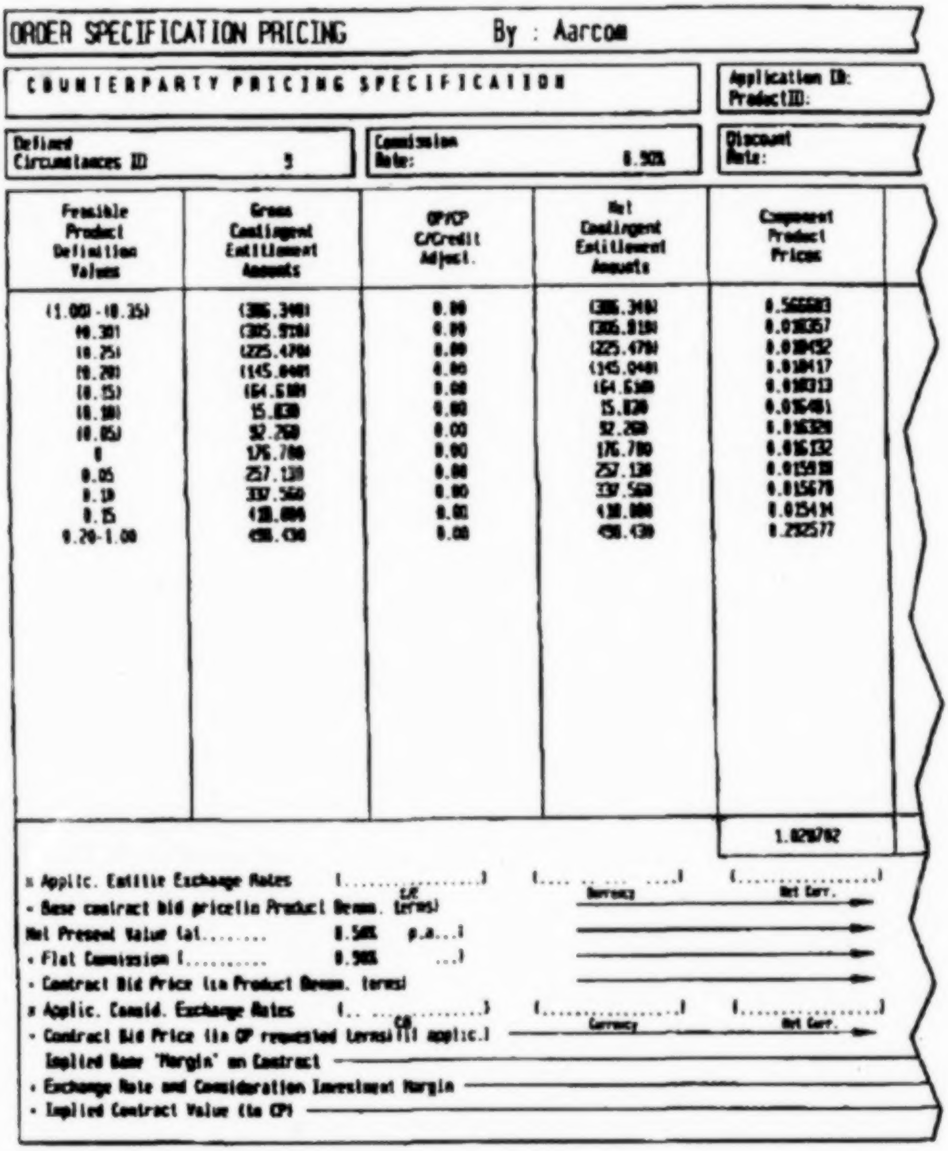
Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

5.90% p.a.

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(219.382)	0.544514	(210.3675)	(210.3675)	
(6.777)	0.016830	(5.151)	(5.151)	
(4.947)	0.016793	(3.786)	(3.786)	
(2.8346)	0.016710	(2.425)	(2.425)	
(1.1289)	0.016614	(1.073)	(1.073)	
0.2729	0.016481	0.261		
1.6354	0.016329	1.571		
2.8727	0.016132	2.851		
4.1143	0.015910	4.093		
5.3493	0.015670	5.292		
6.5433	0.015414	6.443		
144.6633	0.25257	145.825		(498.43)
(63.432)	1.0000	(56.463)	(222.8025)	(498.430)

FIG. 53



ORDER SPECIFICATION PRICING By : Aarcom

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID:

Defined Circumstances ID 5

Commission Rate: 0.50%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	OP/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
(1.00) - (0.35)	(306.340)	0.00	(306.340)	0.565583
(0.30)	(305.930)	0.00	(305.810)	0.018357
(0.25)	(225.470)	0.00	(225.470)	0.018452
(0.20)	(145.040)	0.00	(145.040)	0.018417
(0.15)	(64.510)	0.00	(64.510)	0.018313
(0.10)	15.830	0.00	15.820	0.016481
(0.05)	92.260	0.00	92.260	0.016329
0	176.700	0.00	176.700	0.016132
0.05	257.130	0.00	257.130	0.015918
0.10	337.560	0.00	337.560	0.015679
0.15	418.000	0.00	418.000	0.015414
0.20-1.00	498.430	0.00	498.430	0.292577
				1.028782

x Applic. Entitle Exchange Rates (..................) (..................) (..................)

= Base contract bid price(in Product Denom. terms) E/E Currency Net Curr.

Net Present Value (at........ 0.50% p.a...)

+ Flat Commission (........... 0.50% ...)

= Contract Bid Price (in Product Denom. terms)

x Applic. Consid. Exchange Rates (..................) (..................) (..................)

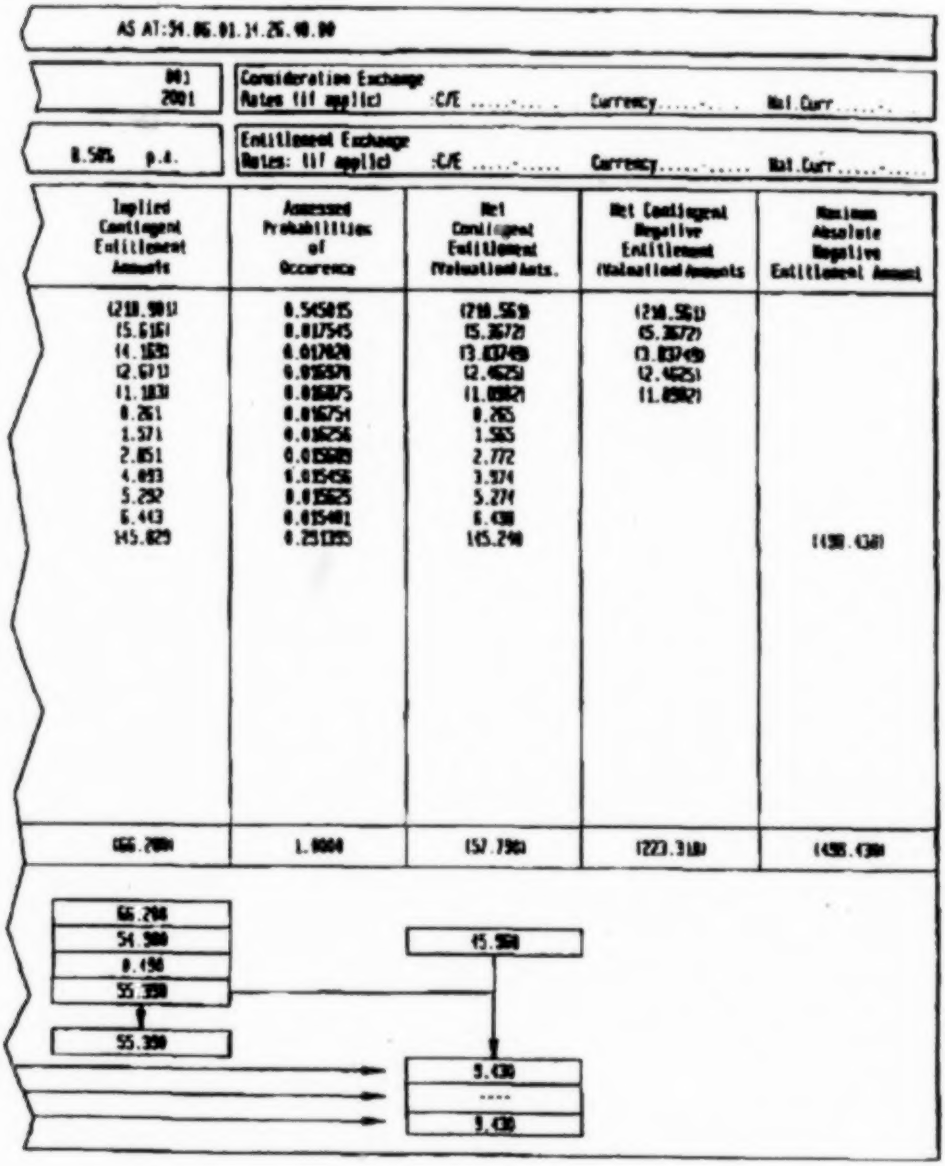
= Contract Bid Price (in CP requested terms)(if applic.) C/B Currency Net Curr.

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

= Implied Contract Value (to CP)

FIG. 53 CONT.



AS AT:94.06.01.14.25.40.00

001
2001

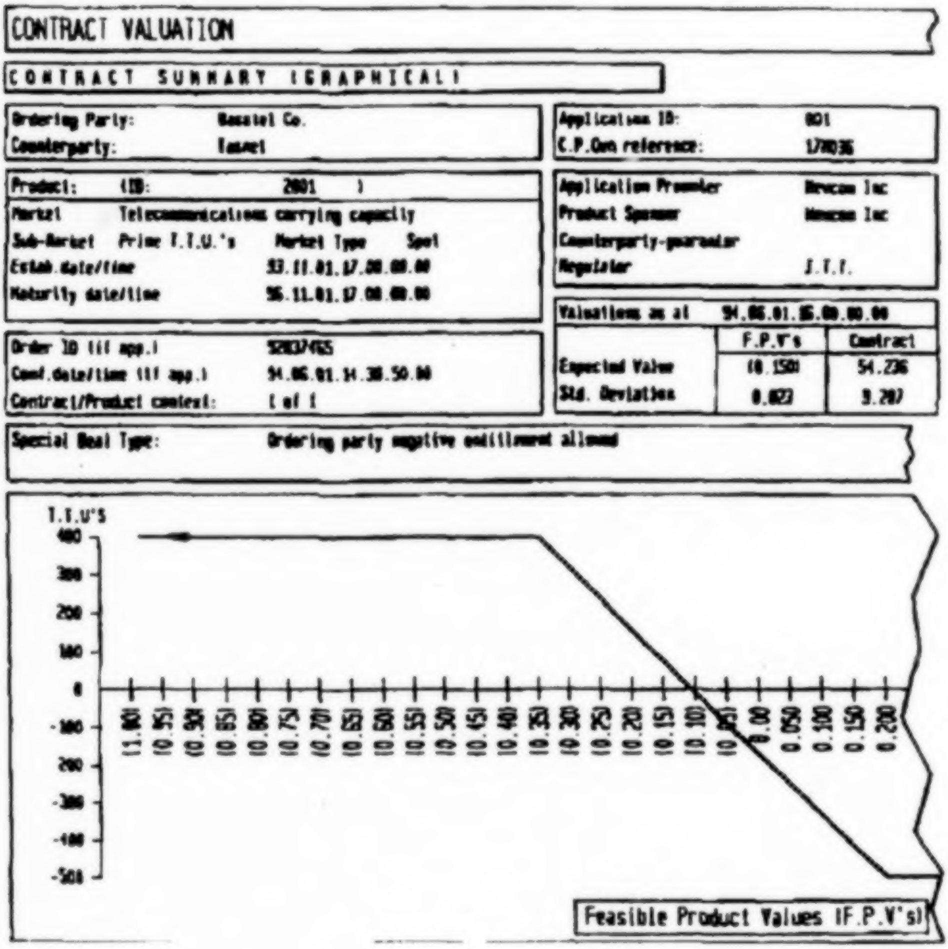
Consideration Exchange
Rates (if applic) :C/E .....·.... Currency.....·.... Nat.Curr.....·....

0.50% p.a.

Entitlement Exchange
Rates: (if applic) :C/E .....·..... Currency.....·..... Nat.Curr.....·.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(218.901)	0.545015	(218.561)	(218.561)	
(5.616)	0.017545	(5.3672)	(5.3672)	
(4.163)	0.017020	(3.83749)	(3.83749)	
(2.671)	0.016570	(2.4625)	(2.4625)	
(1.183)	0.016875	(1.0982)	(1.0982)	
0.261	0.016754	0.265		
1.571	0.016256	1.565		
2.851	0.015605	2.772		
4.093	0.015456	3.974		
5.292	0.015625	5.274		
6.443	0.015401	6.430		
145.829	0.251355	145.290		(150.430)
(66.280)	1.0000	(57.790)	(223.310)	(458.430)

FIG. 54



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Basatel Co.
Counterparty: Tasnet

Product: (ID: 2001)
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab. date/time 93.11.01.17.00.00.00
Maturity date/time 96.11.01.17.00.00.00

Order ID (if app.) 52837455
Conf. date/time (if app.) 94.06.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 001
C.P.Om reference: 178036

Application Promoter Brecom Inc
Product Sponsor Neocom Inc
Counterparty-guarantor
Regulator I.T.I.

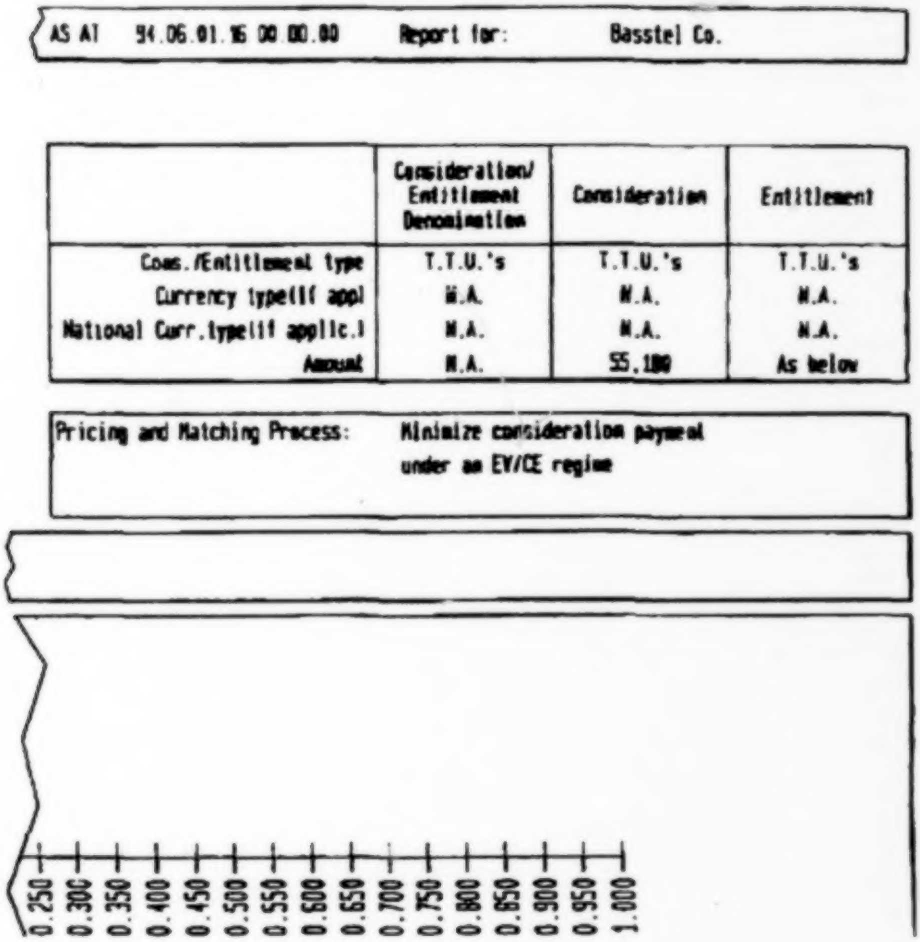
Valuations as at 94.06.01.15.00.00.00

	F.P.V's	Contract
Expected Value	(0.150)	54.236
Std. Deviation	0.023	3.207

Special Deal Type: Ordering party negative entitlement allowed

T.T.U'S
400
300
200
100
0
-100
-200
-300
-400
-500
(1.00)
(0.95)
(0.90)
(0.85)
(0.80)
(0.75)
(0.70)
(0.65)
(0.60)
(0.55)
(0.50)
(0.45)
(0.40)
(0.35)
(0.30)
(0.25)
(0.20)
(0.15)
(0.10)
(0.05)
0.00
0.050
0.100
0.150
0.200
Feasible Product Values (F.P.V's)

FIG. 54 CONT.



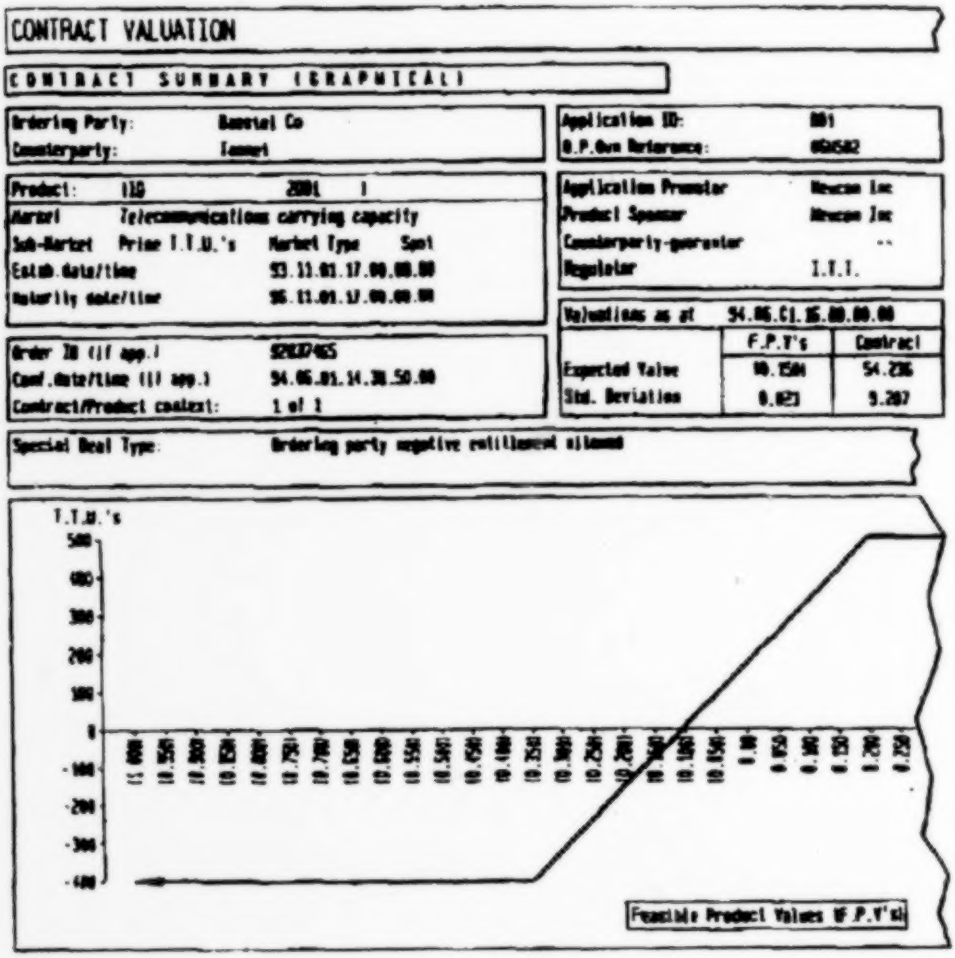
AS AT 94.06.01.16 00.00.00 Report for: Basstel Co.

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,100	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

0.250
0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 55



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Banstel Co
Counterparty: Tamari

Product: 11G 2001 1
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab. date/time 93.11.01.17.00.00.00
Maturity date/time 95.11.01.17.00.00.00

Order ID (if app.) 92837465
Conf. date/time (if app.) 94.06.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 001
O.P. Own Reference: 050582

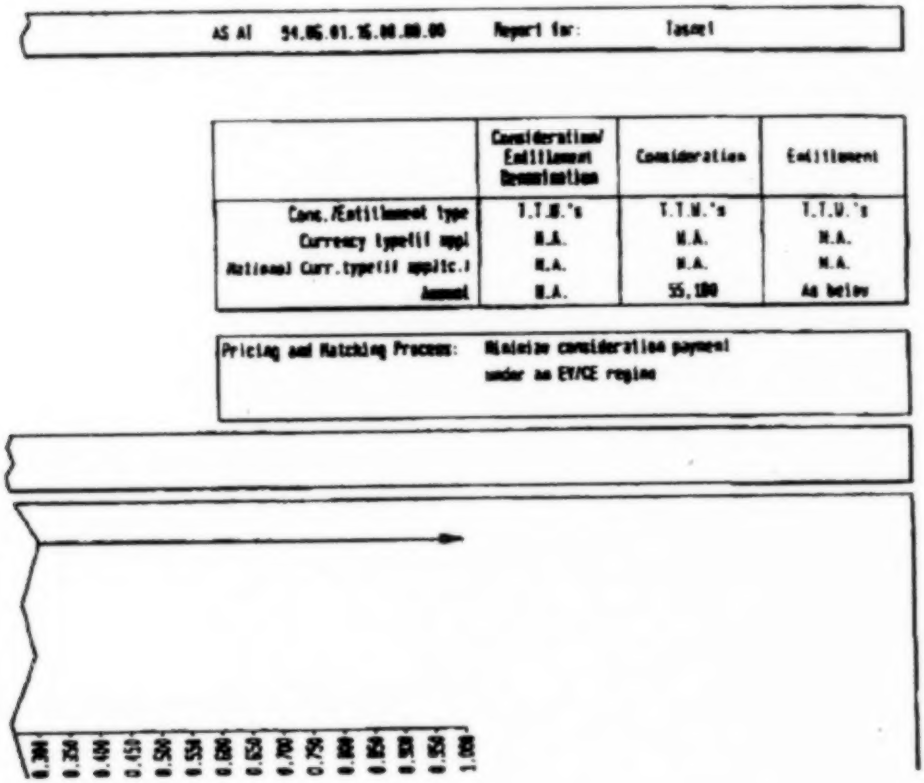
Application Promoter Nexcon Inc
Product Sponsor Nexcon Inc
Counterparty-guarantor --
Regulator I.T.I.

Valuations as at 94.06.01.15.00.00.00

	F.P.V's	Contract
Expected Value	10.1504	54.236
Std. Deviation	0.023	9.287

Special Deal Type: Ordering party negative entitlement allowed

FIG. 55 CONT.



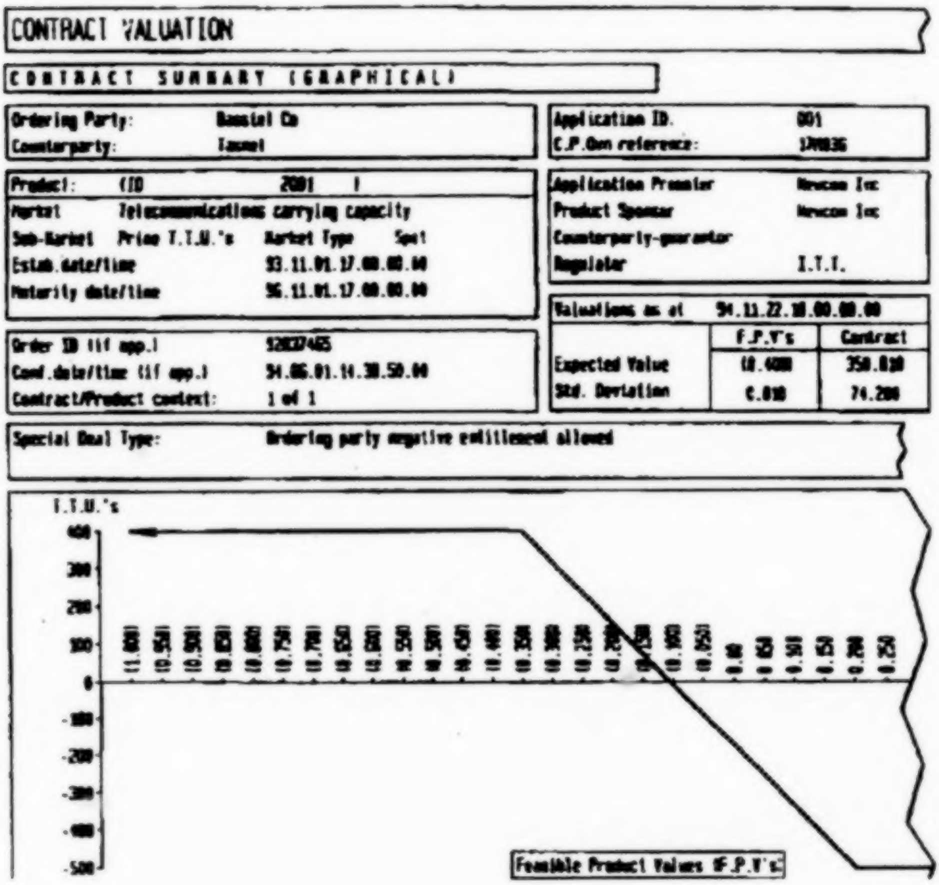
AS At 94.06.01.15.00.00.00 Report for: Tasmel

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,100	As below

Pricing and Matching Process: Minimize consideration payment under an EY/CE regime

0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 56



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bassiel Co
Counterparty: Tasmel

Application ID. 001
C.P.Own reference: 170036

Product: (ID 2001)
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 93.11.01.17.00.00.00
Maturity date/time 96.11.01.17.00.00.00

Application Promoter Newcom Inc
Product Sponsor Newcom Inc
Counterparty-guarantor
Regulator I.T.I.

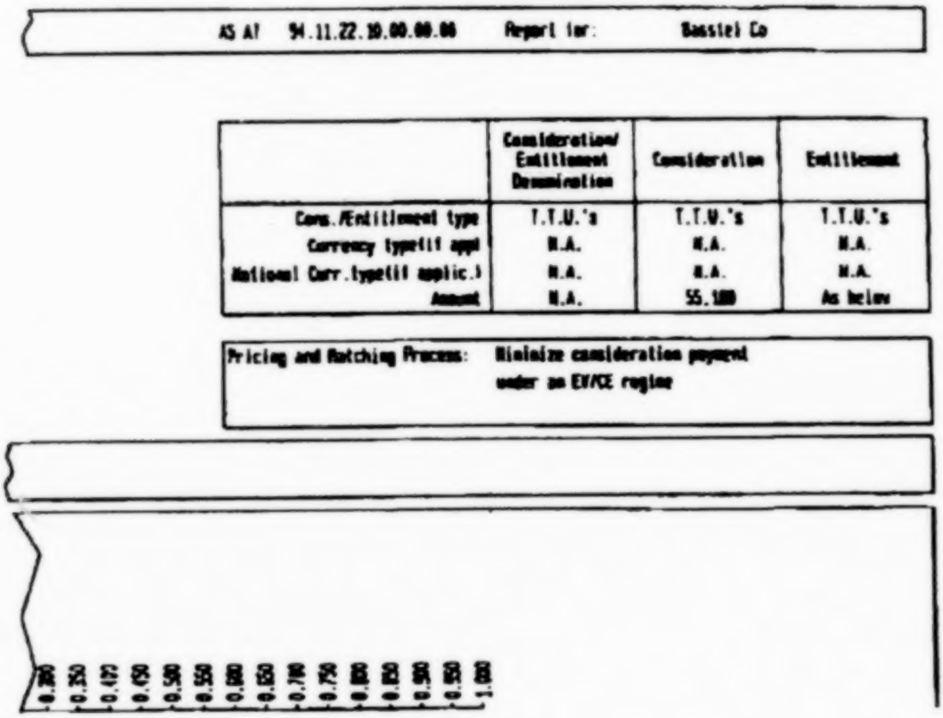
Order ID (if app.) 52037465
Conf.date/time (if app.) 94.06.01.14.30.50.00
Contract/Product context: 1 of 1

Valuations as at	94.11.22.10.00.00.00	
	F.P.V's	Contract
Expected Value	10.400	350.010
Std. Deviation	0.010	74.200

Special Deal Type: Ordering party negative entitlement allowed

T.T.U.'s
400
300
200
100
0
-100
-200
-300
-400
-500
11.000
10.950
10.900
10.850
10.800
10.750
10.700
10.650
10.600
10.550
10.500
10.450
10.400
10.350
10.300
10.250
10.200
10.150
10.100
10.050
Feasible Product Values (F.P.V's)

FIG. 56 CONT.



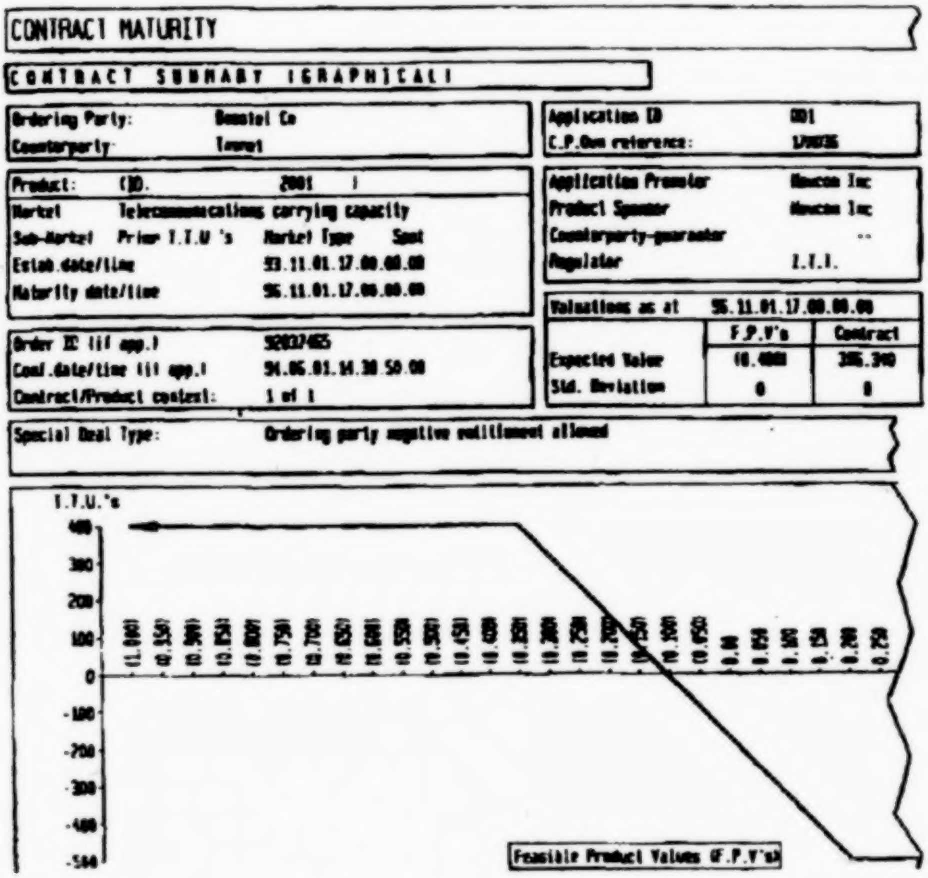
AS AT 94.11.22.10.00.00.00 Report for: Basstel Co

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55.100	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 57



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Beantel Co
Counterparty:	Inmet

Product:	(ID.	2001	)
Market	Telecommunications carrying capacity		
Sub-Market	Prior I.T.U 's	Market Type	Spot
Estab.date/time		93.11.01.17.00.00.00	
Maturity date/time		96.11.01.17.00.00.00	

Order ID (if app.)	52037465
Conf.date/time (if app.)	94.06.01.14.30.50.00
Contract/Product context:	1 of 1

Application ID	001
C.P.Own reference:	170036

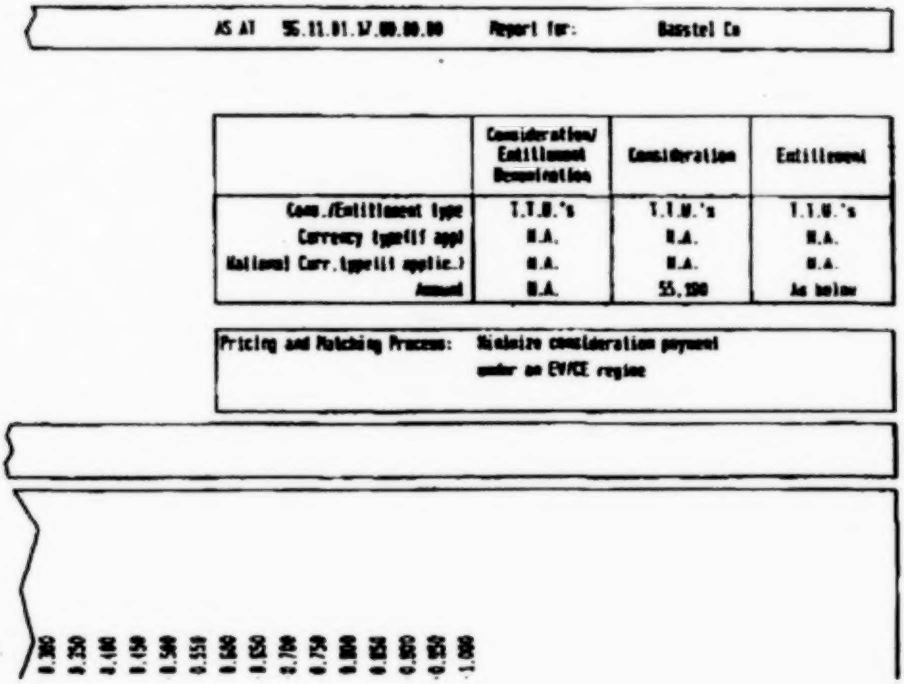
Application Promoter	Haucon Inc
Product Sponsor	Haucon Inc
Counterparty-guarantor	--
Regulator	I.T.I.

Valuations as at 96.11.01.17.00.00.00

	F.P.V's	Contract
Expected Value	(0.400)	386.340
Std. Deviation	0	0

Special Deal Type: Ordering party negative entitlement allowed

FIG. 57 CONT.



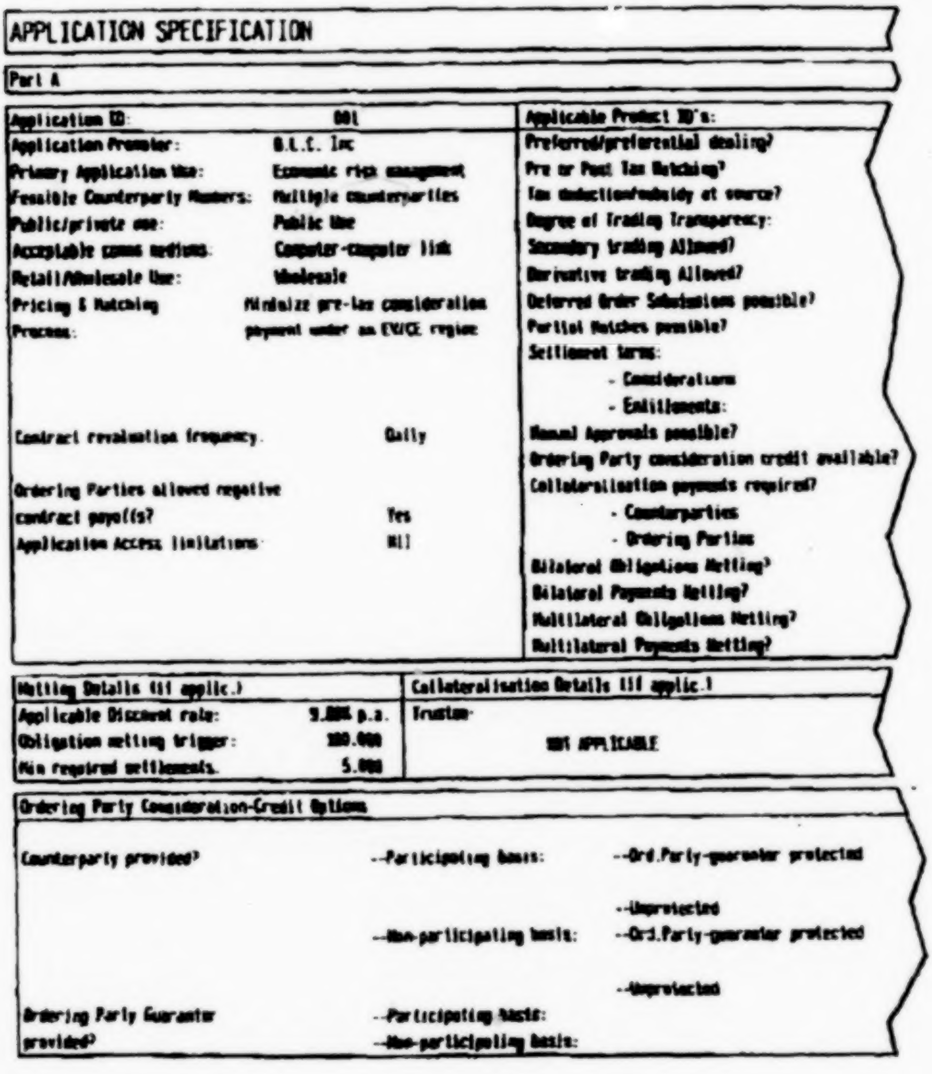
AS AT 55.11.01.17.00.00.00 Report for: Basstel Co

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,190	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 58



APPLICATION SPECIFICATION

Part A

Application ID:	001
Application Promoter:	B.L.C. Inc
Primary Application Use:	Economic risk management
Feasible Counterparty Numbers:	Multiple counterparties
Public/private use:	Public Use
Acceptable comms mediums:	Computer-computer link
Retail/Wholesale Use:	Wholesale
Pricing & Matching Process:	Minimize pre-tax consideration payment under an EU/CE regime
Contract revaluation frequency.	Daily
Ordering Parties allowed negative contract payoffs?	Yes
Application Access limitations:	Nil

Applicable Product ID's:

Preferred/preferential dealing?
Pre or Post Tax Matching?
Tax deduction/subsidy at source?
Degree of Trading Transparency:
Secondary trading Allowed?
Derivative trading Allowed?
Deferred Order Submissions possible?
Partial Matches possible?
Settlement terms:
- Considerations
- Entitlements:

Manual Approvals possible?
Ordering Party consideration credit available?
Collateralisation payments required?
- Counterparties
- Ordering Parties

Bilateral Obligations Netting?
Bilateral Payments Netting?
Multilateral Obligations Netting?
Multilateral Payments Netting?

Netting Details (if applic.)

Applicable Discount rate:	9.00% p.a.
Obligation netting trigger:	100.000
Min required settlements.	5.000

Collateralisation Details (if applic.)

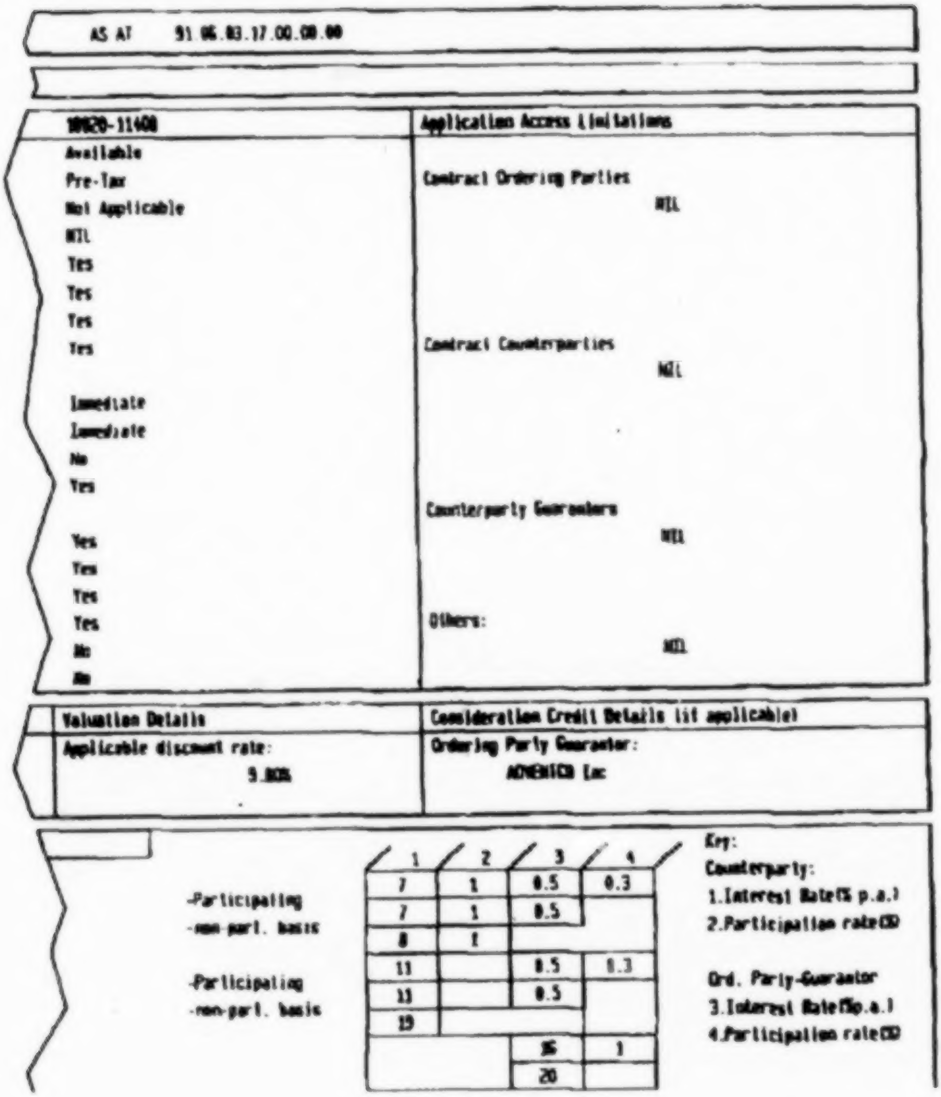
Trustee:

NOT APPLICABLE

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating basis:	--Ord.Party-guarantor protected
		--Unprotected
	--Non-participating basis:	--Ord.Party-guarantor protected
		--Unprotected
Ordering Party Guarantor provided?	--Participating basis:	
	--Non-participating basis:	

FIG. 58 CONT.



AS AT 91.06.03.17.00.00.00

10020-11400

Available
Pre-Tax
Not Applicable
NIL
Yes
Yes
Yes
Yes

Immediate
Immediate
No
Yes

Yes
Yes
Yes
Yes
No
No

Application Access Limitations

Contract Ordering Parties
NIL

Contract Counterparties
NIL

Counterparty Guarantors
NIL

Others:
NIL

Valuation Details

Applicable discount rate:
9.00%

Consideration Credit Details (if applicable)

Ordering Party Guarantor:
ADVENICO Inc

-Participating
-non-part. basis

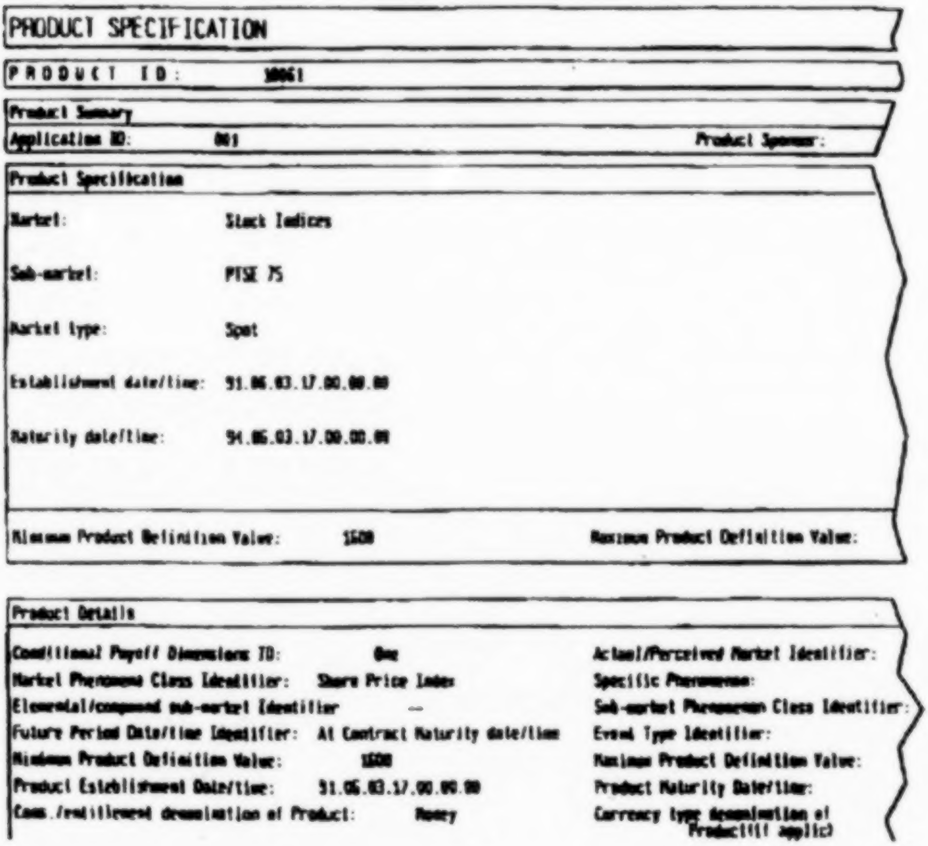
-Participating
-non-part. basis

1	2	3	4
7	1	0.5	0.3
7	1	0.5	
8	1		
11		0.5	0.3
11		0.5	
19			
		35	1
		20	

Key:
Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Ord. Party-Guarantor
3.Interest Rate(%p.a.)
4.Participation rate(%)

FIG. 59



PRODUCT SPECIFICATION

PRODUCT ID: 10061

Product Summary

Application ID: 001

Product Sponsor:

Product Specification

Market: Stock Indices

Sub-market: FTSE 75

Market type: Spot

Establishment date/time: 91.06.03.17.00.00.00

Maturity date/time: 94.06.03.17.00.00.00

Minimum Product Definition Value: 1500

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Actual/Perceived Market Identifier:

Market Phenomena Class Identifier: Share Price Index

Specific Phenomenon:

Elemental/compound sub-market Identifier —

Sub-market Phenomenon Class Identifier:

Future Period Date/time Identifier: At Contract Maturity date/time

Event Type Identifier:

Minimum Product Definition Value: 1500

Maximum Product Definition Value:

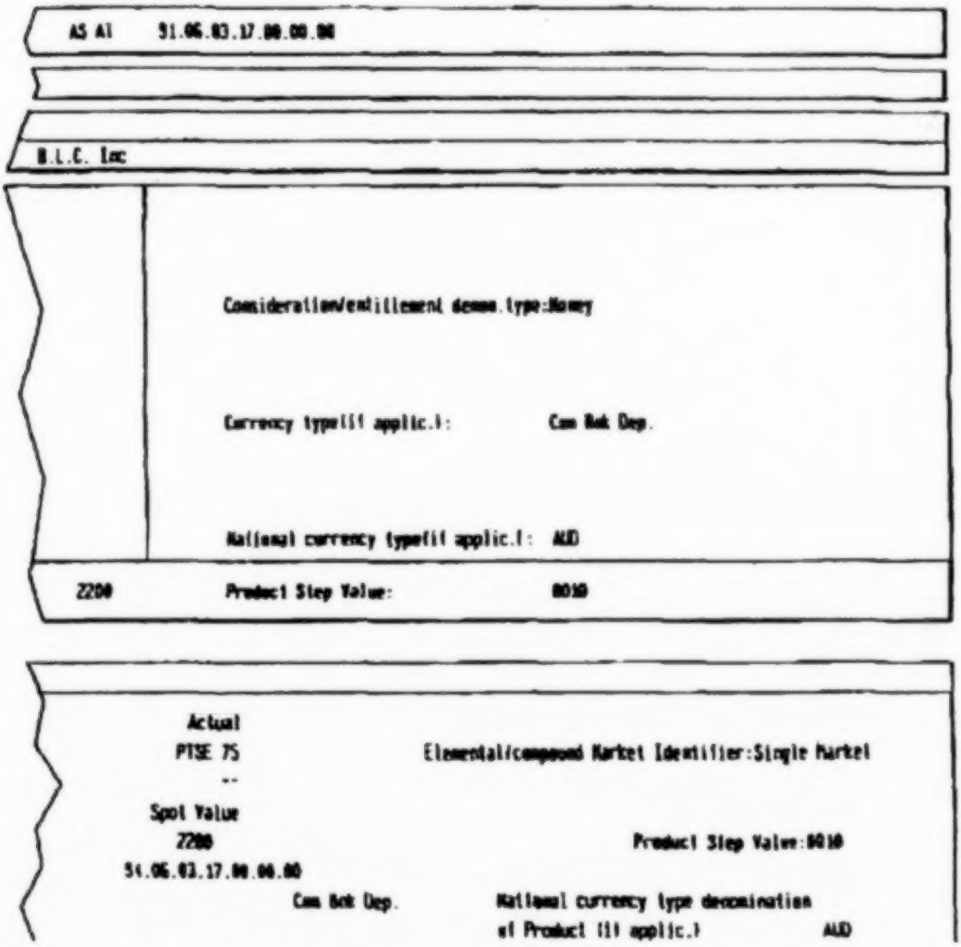
Product Establishment Date/time: 91.06.03.17.00.00.00

Product Maturity Date/time:

Comm./entitlement denomination of Product: Money

Currency type denomination of Product(if applic)

FIG. 59 CONT.



AS A1 91.06.03.17.00.00.00

B.L.C. Inc

Consideration/entitlement denom. type:Money

Currency type(if applic.): Com Bnk Dep.

National currency type(if applic.): AUD

2200 Product Step Value: 0010

Actual
PTSE 75
--
Spot Value
2200
91.06.03.17.00.00.00

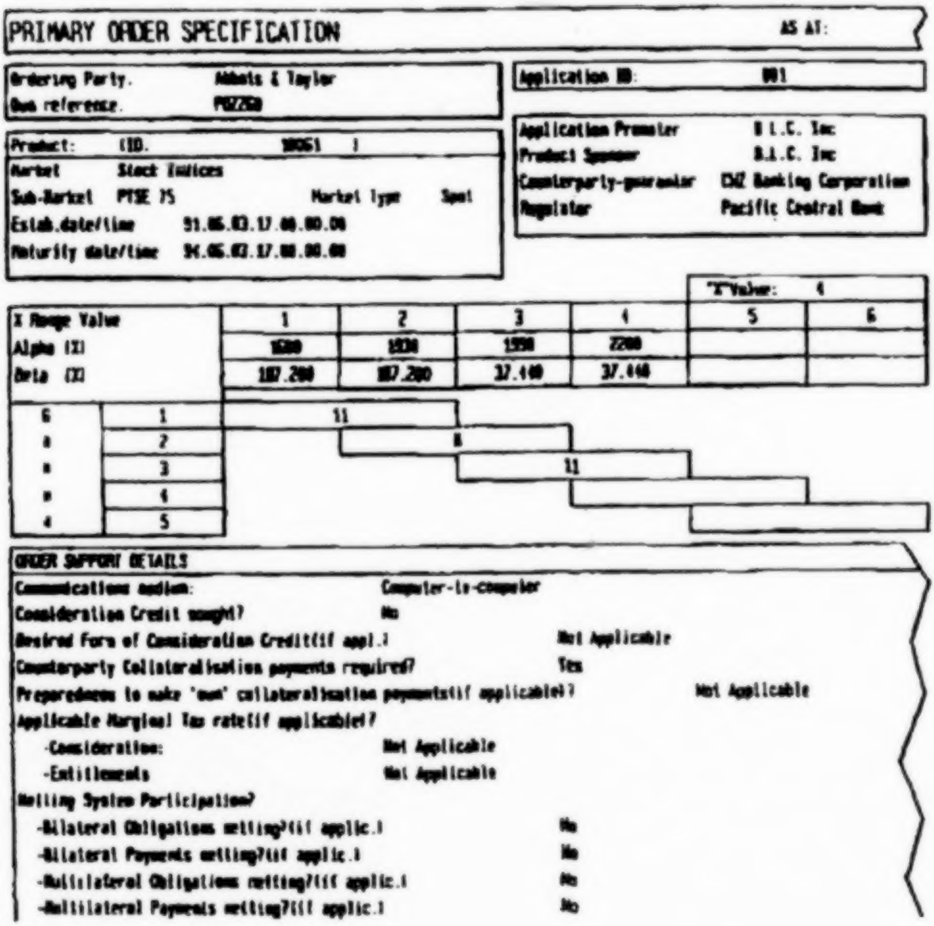
Elemental/compound Market Identifier:Single Market

Product Step Value:0010

Com Bnk Dep.

National currency type denomination of Product (if applic.) AUD

FIG. 60



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party. Abbots & Taylor
Own reference. P02260

Application ID: 001

Product: (ID. 10061)
Market Stock Indices
Sub-Market PTSE 75 Market Type Spot
Estab.date/time 91.05.03.17.00.00.00
Maturity date/time 94.05.03.17.00.00.00

Application Promoter B.I.C. Inc
Product Sponsor B.I.C. Inc
Counterparty-guarantor CXZ Banking Corporation
Regulator Pacific Central Bank

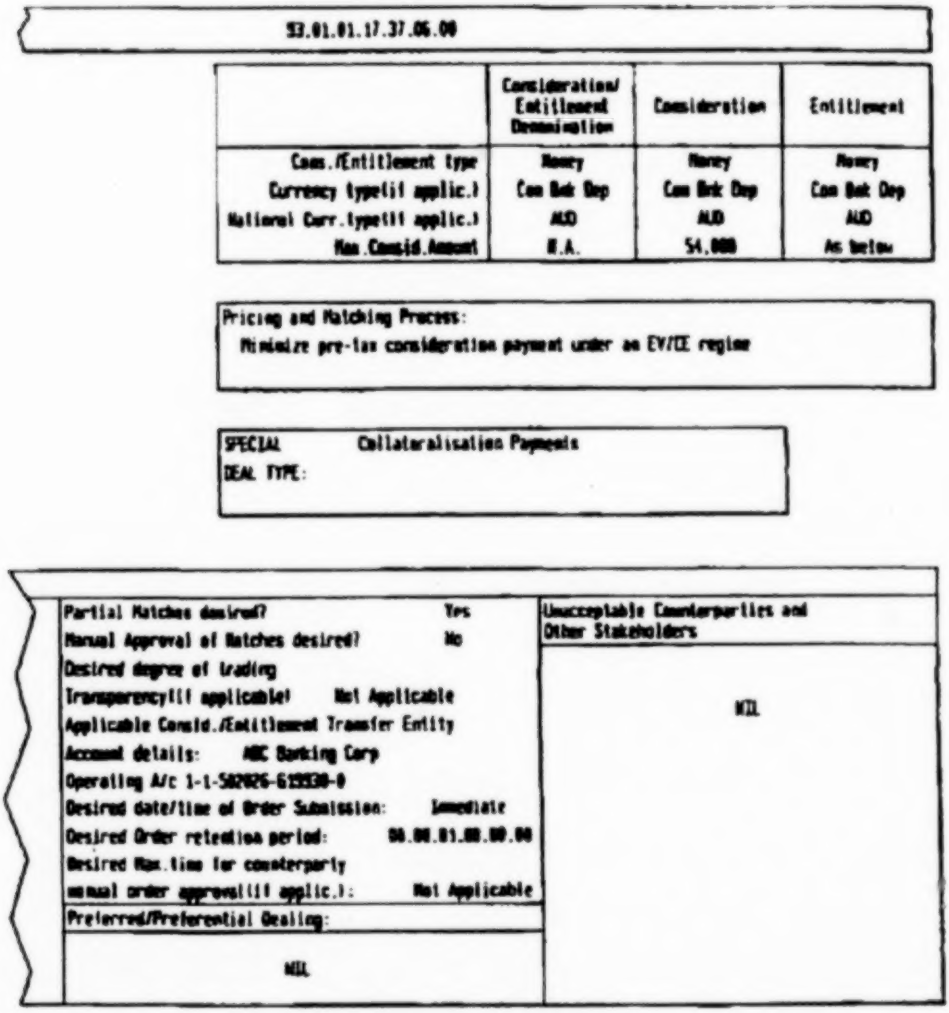
"X"Value: 4

<table>
<tr><td colspan="2">X Range Value</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td colspan="2">Alpha (X)</td><td>1600</td><td>1830</td><td>1550</td><td>2200</td><td></td><td></td></tr>
<tr><td colspan="2">Beta (X)</td><td>107.200</td><td>107.200</td><td>37.440</td><td>37.440</td><td></td><td></td></tr>
<tr><td>G</td><td>1</td><td colspan="2">11</td><td></td><td></td><td></td><td></td></tr>
<tr><td>a</td><td>2</td><td></td><td colspan="2">8</td><td></td><td></td><td></td></tr>
<tr><td>m</td><td>3</td><td></td><td></td><td colspan="2">11</td><td></td><td></td></tr>
<tr><td>m</td><td>4</td><td></td><td></td><td></td><td colspan="2"></td><td></td></tr>
<tr><td>a</td><td>5</td><td></td><td></td><td></td><td></td><td colspan="2"></td></tr>
</table>

ORDER SUPPORT DETAILS

Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? Yes
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 60 CONT.



93.01.01.17.37.06.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	54,000	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an EV/CE regime

SPECIAL DEAL TYPE: Collateralisation Payments

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading
Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-582026-619930-0
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty
manual order approval(if applic.): Not Applicable

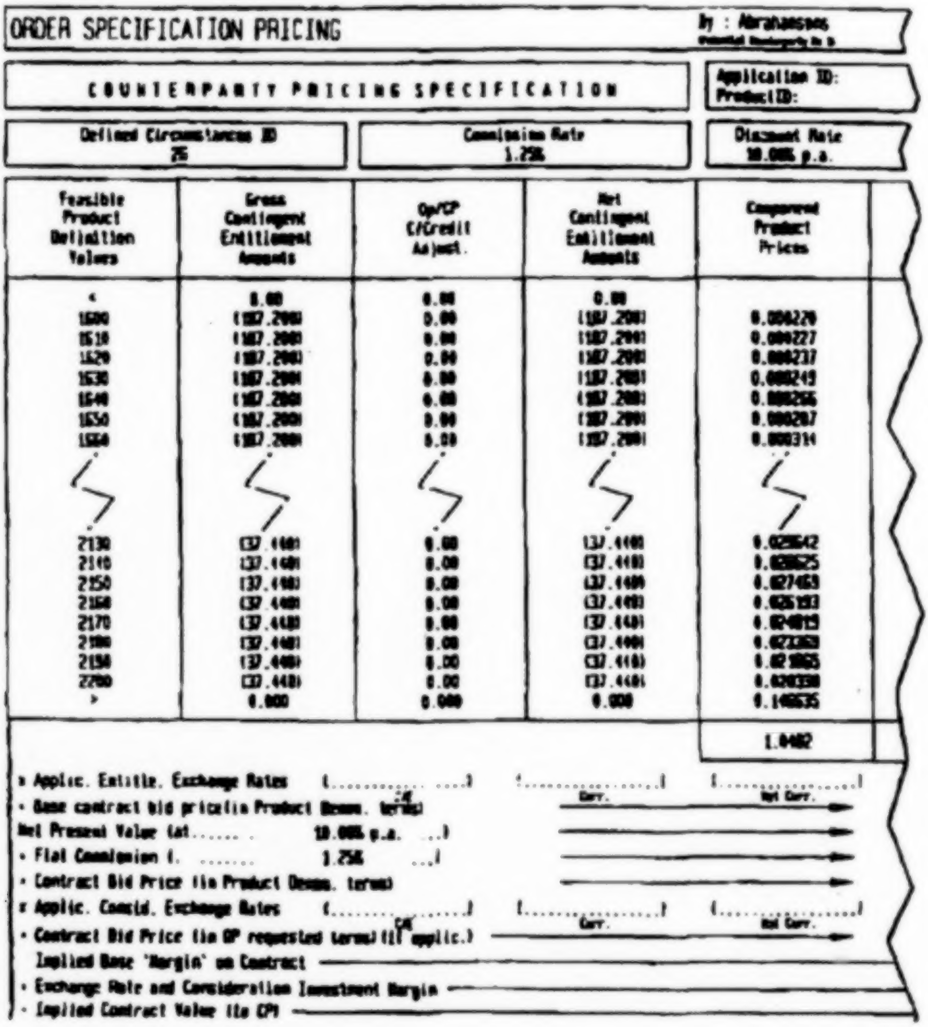
Preferred/Preferential Dealing:

NIL

Unacceptable Counterparties and Other Stakeholders

NIL

FIG. 61



ORDER SPECIFICATION PRICING

By : Abrahamsen

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID:

Defined Circumstances ID	Commission Rate	Discount Rate
25	1.25%	10.00% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Compound Product Prices
<	0.00	0.00	0.00	
1600	(187.200)	0.00	(187.200)	0.000220
1610	(187.200)	0.00	(187.200)	0.000227
1620	(187.200)	0.00	(187.200)	0.000237
1630	(187.200)	0.00	(187.200)	0.000249
1640	(187.200)	0.00	(187.200)	0.000266
1650	(187.200)	0.00	(187.200)	0.000287
1660	(187.200)	0.00	(187.200)	0.000314
2130	(37.440)	0.00	(37.440)	0.029642
2140	(37.440)	0.00	(37.440)	0.028625
2150	(37.440)	0.00	(37.440)	0.027463
2160	(37.440)	0.00	(37.440)	0.026193
2170	(37.440)	0.00	(37.440)	0.024815
2180	(37.440)	0.00	(37.440)	0.023363
2190	(37.440)	0.00	(37.440)	0.021865
2200	(37.440)	0.00	(37.440)	0.020330
>	0.000	0.000	0.000	0.146635
				1.0402

x Applic. Entitle. Exchange Rates (.................) (.................) (.................)

Curr. Opt Curr.

= Base contract bid price (in Product Denom. terms)

Net Present Value (at....... 10.00% p.a. ...)

+ Flat Commission (. .... 1.25% ...)

= Contract Bid Price (in Product Denom. terms)

x Applic. Consid. Exchange Rates (.................) (.................) (.................)

Curr. Nat Curr.

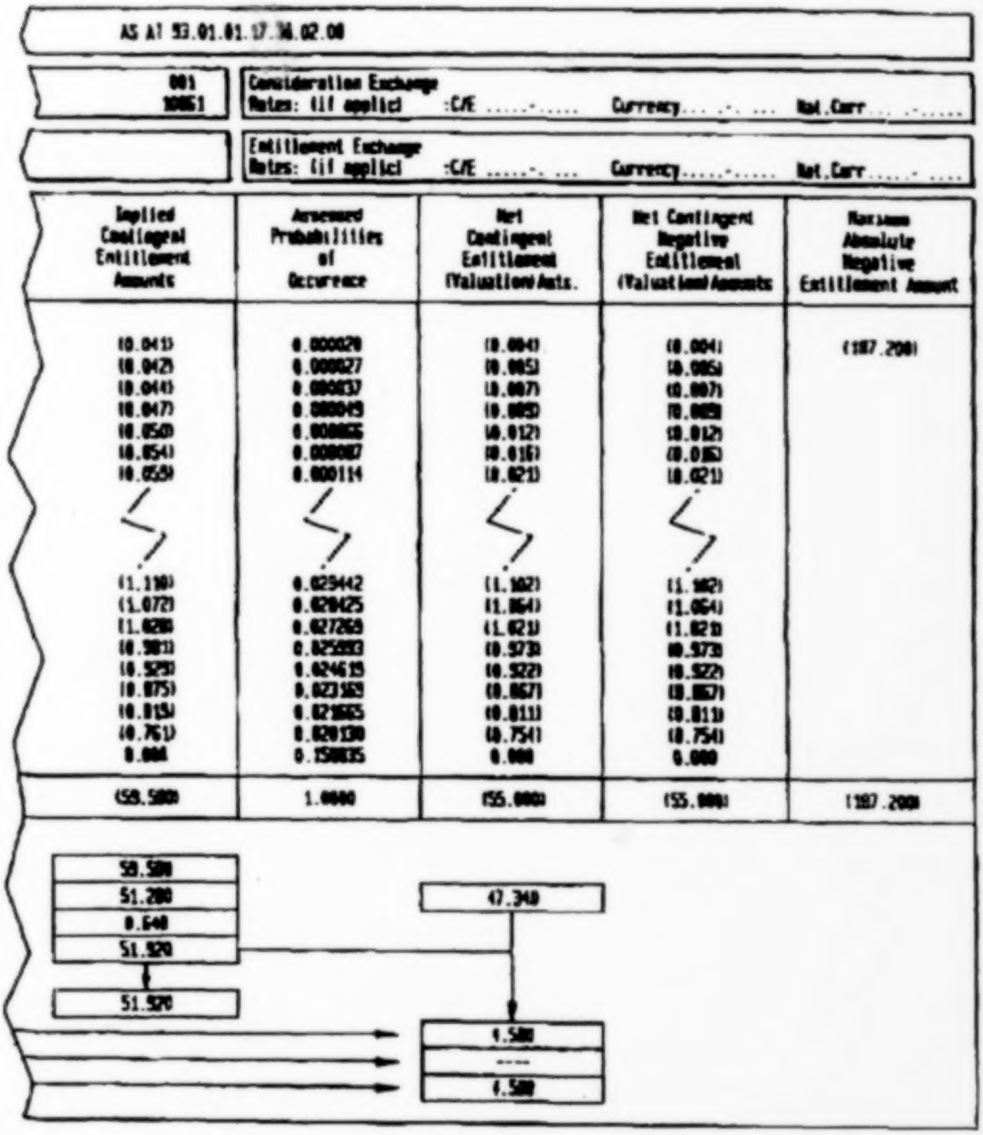
= Contract Bid Price (in CP requested terms) (if applic.)

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

= Implied Contract Value (to CP)

FIG. 61 CONT.



AS AT 93.01.01.17.36.02.00

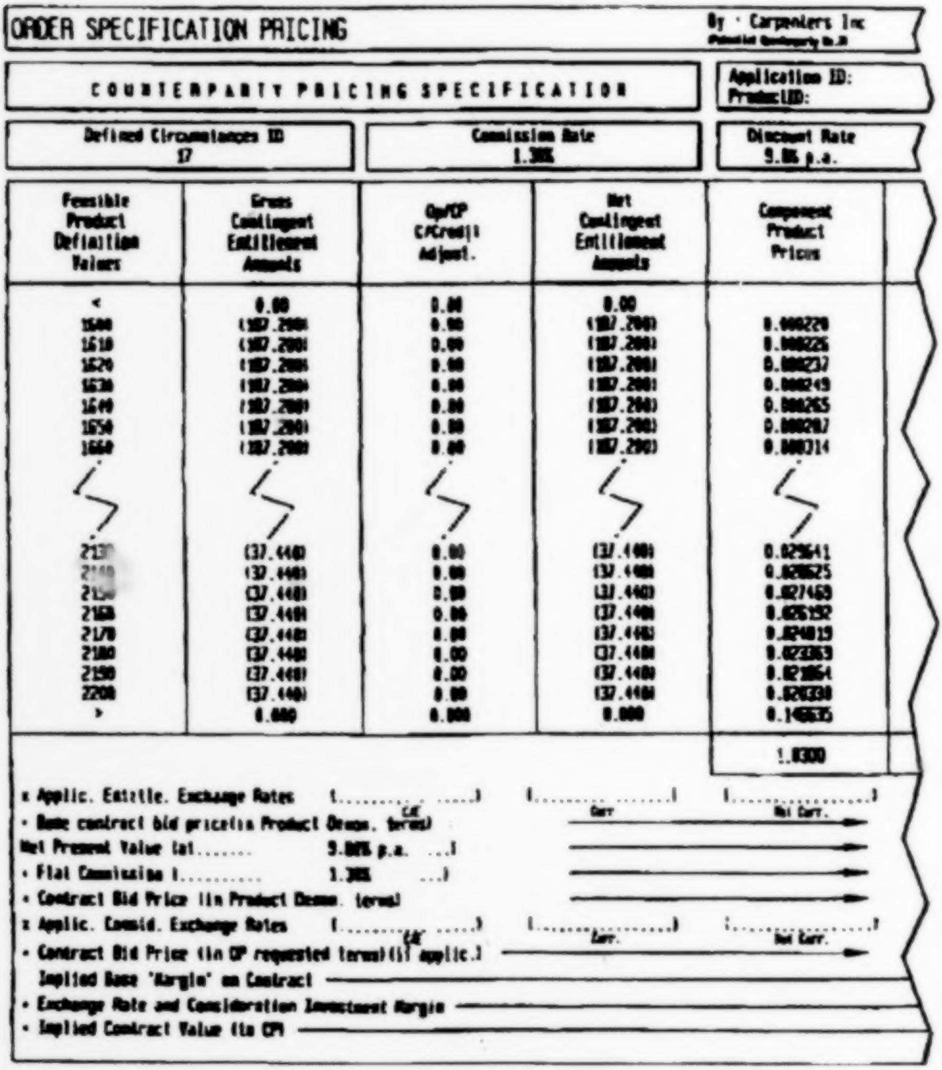
001
10051

Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency... .-. ... Nat.Corr... .-.....

Entitlement Exchange
Rates: (if applic) :C/E .....-. ... Currency.....-..... Nat.Corr.....- ....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(0.041)	0.000020	(0.004)	(0.004)	(187.200)
(0.042)	0.000027	(0.005)	(0.005)	
(0.044)	0.000037	(0.007)	(0.007)	
(0.047)	0.000049	(0.009)	(0.009)	
(0.050)	0.000066	(0.012)	(0.012)	
(0.054)	0.000087	(0.016)	(0.016)	
(0.059)	0.000114	(0.021)	(0.021)	
(1.110)	0.029442	(1.102)	(1.102)	
(1.072)	0.028425	(1.064)	(1.064)	
(1.028)	0.027269	(1.021)	(1.021)	
(0.981)	0.025993	(0.973)	(0.973)	
(0.529)	0.024619	(0.522)	(0.522)	
(0.875)	0.023163	(0.867)	(0.867)	
(0.819)	0.021665	(0.811)	(0.811)	
(0.761)	0.020130	(0.754)	(0.754)	
0.000	0.150835	0.000	0.000	
(59.500)	1.0000	(55.000)	(55.000)	(187.200)

FIG. 62



ORDER SPECIFICATION PRICING

By : Carpenters Inc
[illegible]

COUNTERPARTY PRICING SPECIFICATION

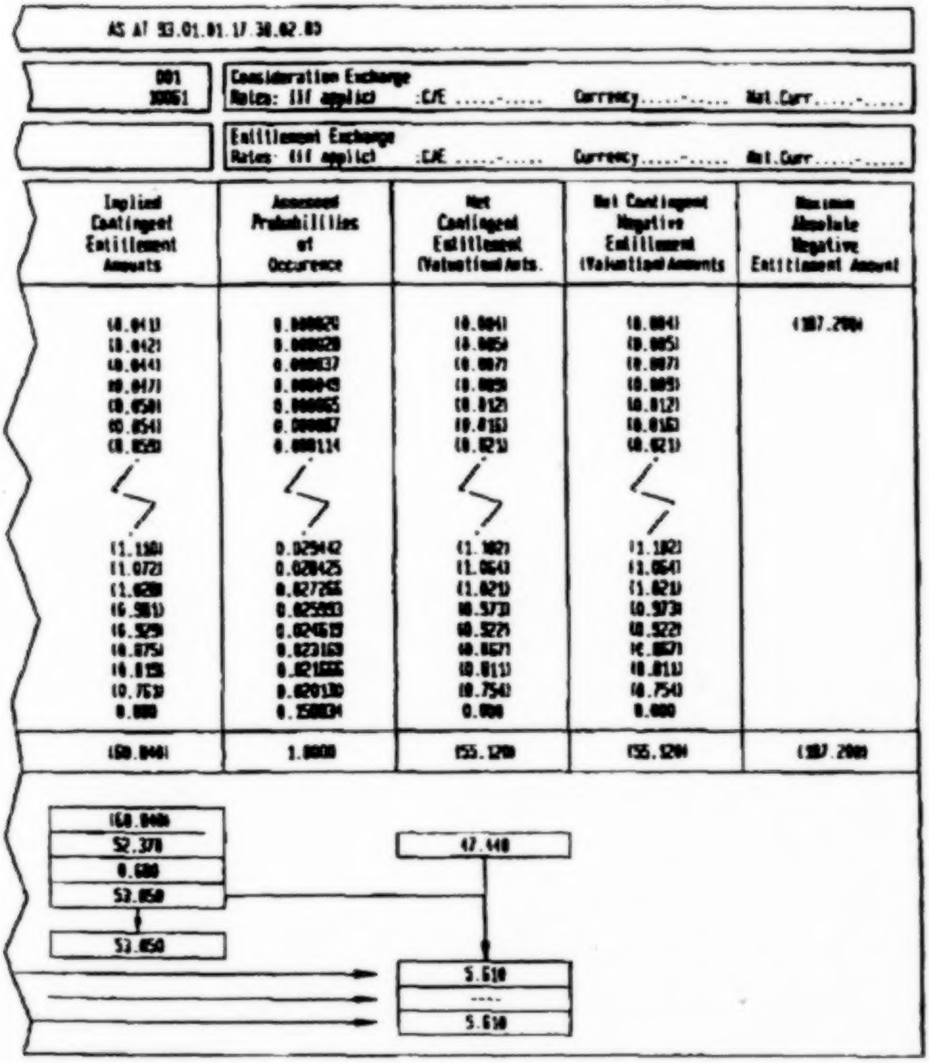
Application ID:
Product ID:

Defined Circumstances ID	Commission Rate	Discount Rate
17	1.30%	9.0% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
<	0.00	0.00	0.00	
1600	(107.200)	0.00	(107.200)	0.000220
1610	(107.200)	0.00	(107.200)	0.000225
1620	(107.200)	0.00	(107.200)	0.000237
1630	(107.200)	0.00	(107.200)	0.000249
1640	(107.200)	0.00	(107.200)	0.000265
1650	(107.200)	0.00	(107.200)	0.000287
1660	(107.200)	0.00	(107.200)	0.000314
2130	(37.440)	0.00	(37.440)	0.029641
2140	(37.440)	0.00	(37.440)	0.028625
2150	(37.440)	0.00	(37.440)	0.027469
2160	(37.440)	0.00	(37.440)	0.026192
2170	(37.440)	0.00	(37.440)	0.024819
2180	(37.440)	0.00	(37.440)	0.023363
2190	(37.440)	0.00	(37.440)	0.021864
2200	(37.440)	0.00	(37.440)	0.020330
>	0.000	0.000	0.000	0.148635
				1.0300

x Applic. Entitle. Exchange Rates (.................) (.................) (.................)
C/E Curr Nat Curr.
= Base contract bid price(in Product Denom. terms)
Net Present Value (at....... 9.00% p.a. ...)
- Flat Commission (.......... 1.30% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (.................) (.................) (.................)
C/E Curr. Nat Curr.
= Contract Bid Price (in CP requested terms)(if applic.)
Implied Base "Margin" on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (to CP)

FIG. 62 CONT.



AS AT 93.01.01.17.30.02.03

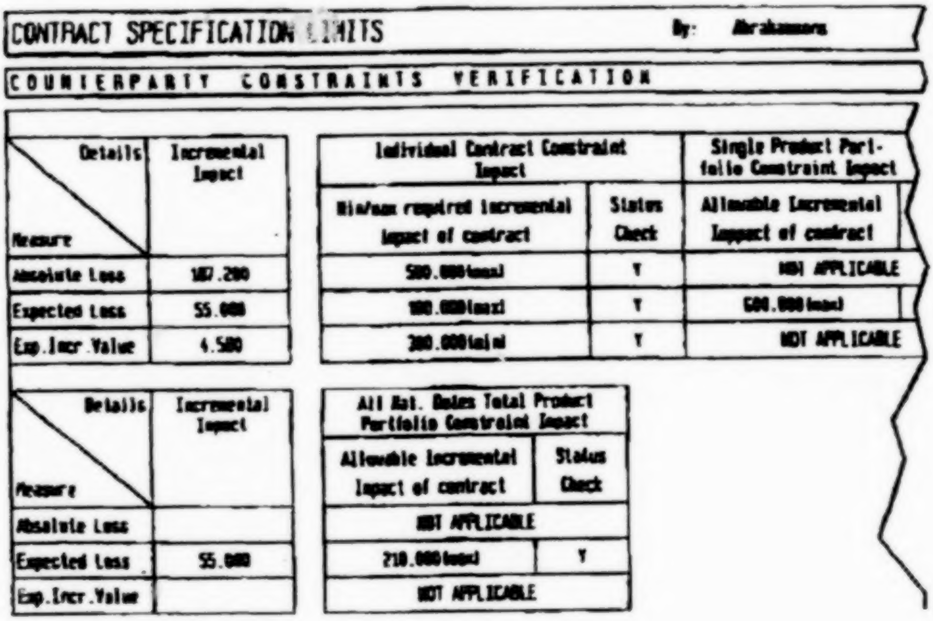
001
30061

Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(0.041)	0.000029	(0.004)	(0.004)	(107.200)
(0.042)	0.000028	(0.005)	(0.005)	
(0.044)	0.000037	(0.007)	(0.007)	
(0.047)	0.000049	(0.009)	(0.009)	
(0.050)	0.000065	(0.012)	(0.012)	
(0.054)	0.000087	(0.016)	(0.016)	
(0.059)	0.000114	(0.021)	(0.021)	
(1.110)	0.029442	(1.102)	(1.102)	
(1.072)	0.028425	(1.064)	(1.064)	
(1.028)	0.027266	(1.021)	(1.021)	
(0.981)	0.025993	(0.973)	(0.973)	
(0.929)	0.024619	(0.922)	(0.922)	
(0.875)	0.023163	(0.867)	(0.867)	
(0.819)	0.021666	(0.811)	(0.811)	
(0.763)	0.020130	(0.754)	(0.754)	
0.000	0.150034	0.000	0.000	
(60.040)	1.0000	(55.120)	(55.120)	(107.200)

FIG. 63



CONTRACT SPECIFICATION LIMITS By: Abrahamsons

COUNTERPARTY CONSTRAINTS VERIFICATION

Details / Measure	Incremental Impact
Absolute Loss	187.200
Expected Loss	55.000
Exp.Incr.Value	4.500

Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
Min/max required incremental impact of contract	Status Check	Allowable Incremental Impact of contract
500.000(max)	Y	NOT APPLICABLE
100.000(max)	Y	600.000(max)
300.000(min)	Y	NOT APPLICABLE

Details / Measure	Incremental Impact
Absolute Loss	
Expected Loss	55.000
Exp.Incr.Value	

All Nat. Units Total Product Portfolio Constraint Impact	
Allowable Incremental Impact of contract	Status Check
NOT APPLICABLE	
210.000(max)	Y
NOT APPLICABLE	

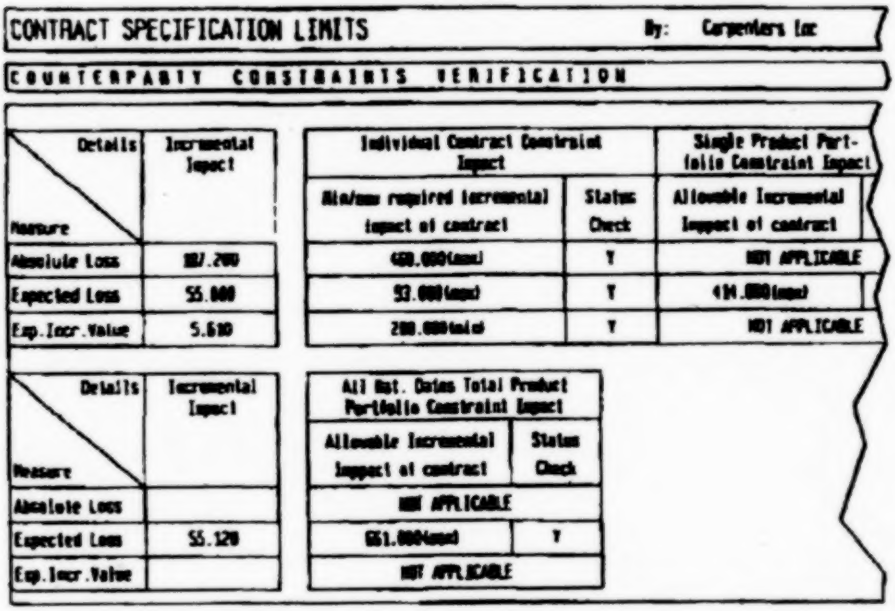
FIG. 63 CONT.

AS AT 93.01.01.17.38.02.00

	"Equivalent" Maturity Date Total Product Portfolio Constraint Impact		"Same Month" Mat. Date Total Product Portfolio Constraint Impact	
Status Check	Allowable Incremental Impact of Contract	Status Check	Allowable Incremental Impact of Contract	Status Check
	NOT APPLICABLE		NOT APPLICABLE	
Y	497.000(max)	Y	1046.000(max)	Y
	NOT APPLICABLE		NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	6 %	7 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	62 %	65 %	Y

FIG. 64



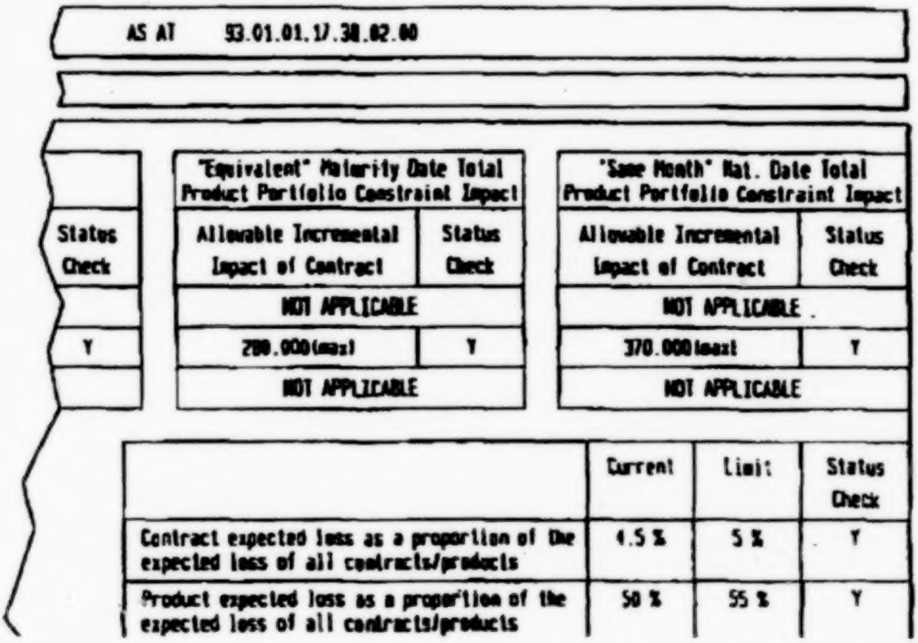
CONTRACT SPECIFICATION LIMITS By: Carpenters Inc

COUNTERPARTY CONSTRAINTS VERIFICATION

Details / Measure	Incremental Impact	Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
		Min/max required incremental impact of contract	Status Check	Allowable Incremental Impact of contract
Absolute Loss	107.200	460.000(max)	Y	NOT APPLICABLE
Expected Loss	55.000	53.000(max)	Y	414.000(max)
Exp.Incr.Value	5.610	200.000(min)	Y	NOT APPLICABLE

Details / Measure	Incremental Impact	All Mat. Dates Total Product Portfolio Constraint Impact	
		Allowable Incremental Impact of contract	Status Check
Absolute Loss		NOT APPLICABLE	
Expected Loss	55.120	651.000(max)	Y
Exp.Incr.Value		NOT APPLICABLE	

FIG. 64 CONT.

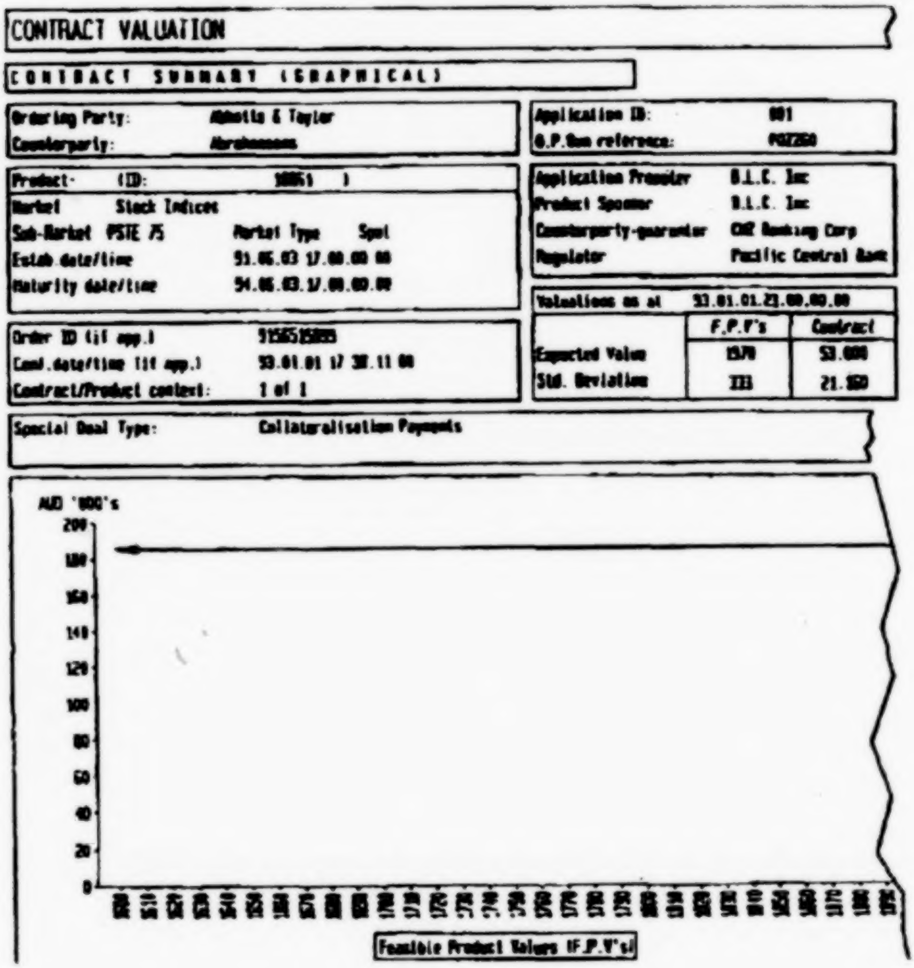


AS AT 93.01.01.17.30.02.00

Status Check	"Equivalent" Maturity Date Total Product Portfolio Constraint Impact		"Same Month" Mat. Date Total Product Portfolio Constraint Impact	
	Allowable Incremental Impact of Contract	Status Check	Allowable Incremental Impact of Contract	Status Check
	NOT APPLICABLE		NOT APPLICABLE	
Y	200.000(max)	Y	370.000(max)	Y
	NOT APPLICABLE		NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	4.5 %	5 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	50 %	55 %	Y

FIG. 65



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Abbotts & Taylor
Counterparty:	Abrahamsons

Application ID:	001
O.P.Sys reference:	P0Z260

Product- (ID: 10051)

Market Stock Indices

Sub-Market FSTE 75 Market Type Spot

Estab date/time 93.06.03 17.00.00 00

Maturity date/time 94.06.03.17.00.00.00

Application Provider	B.L.C. Inc
Product Sponsor	B.L.C. Inc
Counterparty-guarantor	CHZ Banking Corp
Regulator	Pacific Central Bank

Order ID (if app.)	9156515005
Conf.date/time (if app.)	93.01.01 17 38.11 00
Contract/Product context:	1 of 1

Valuations as at 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1970	53.000
Std. Deviation	333	21.160

Special Deal Type: Collateralisation Payments

FIG. 65 CONT.

AS AT: 93.01.01.23.00.00 00 Report for: Abbotts & Taylor

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr. type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	51,520	As below

Pricing and Matching Process:

Minimize pre-tax consideration payment under an EV/CE regime

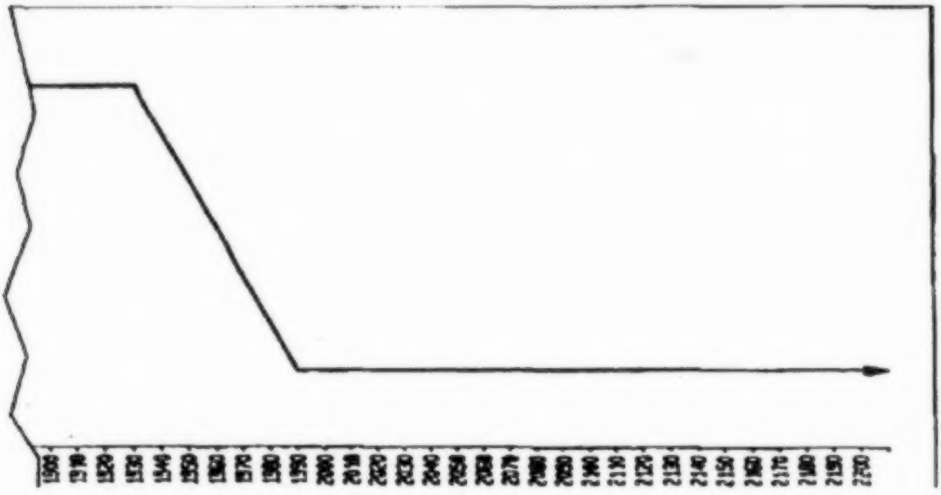
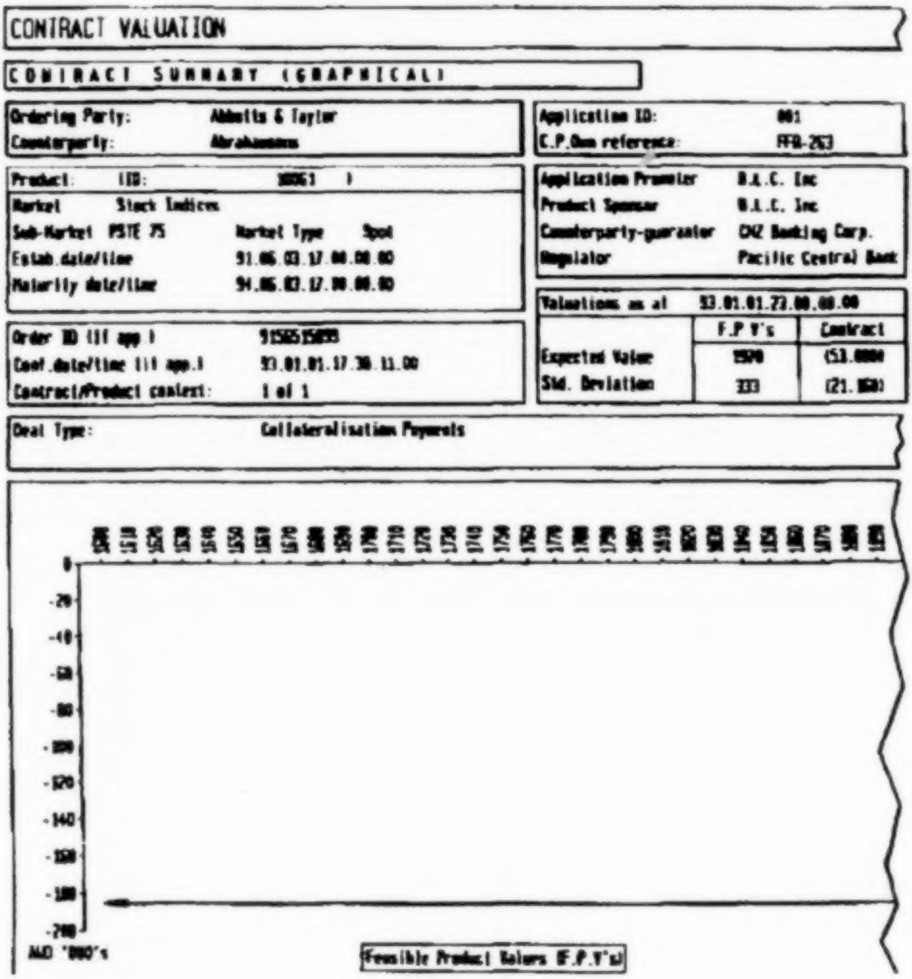


FIG. 66



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Abbotts & Taylor
Counterparty:	Abrahamsons

Application ID:	001
C.P.Own reference:	FFB-263

Product: (ID: 10061)

Market Stock Indices

Sub-Market PSTE 75 Market Type Spot

Estab.date/time 91.06.03.17.00.00.00

Maturity date/time 94.06.03.17.00.00.00

Application Promoter	B.J.C. Inc
Product Sponsor	B.I.C. Inc
Counterparty-guarantor	CHZ Banking Corp.
Regulator	Pacific Central Bank

Order ID (if app.)	9158515055
Conf.date/time (if app.)	93.01.01.17.30.11.00
Contract/Product context:	1 of 1

Valuations as at 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1570	(53.0000
Std. Deviation	333	(21.160)

Deal Type: Collateralisation Payments

FIG. 66 CONT.

AS AT 53.01.01.23.00.00.00 Report for [illegible]

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD
Amount	N.A.	51,520	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

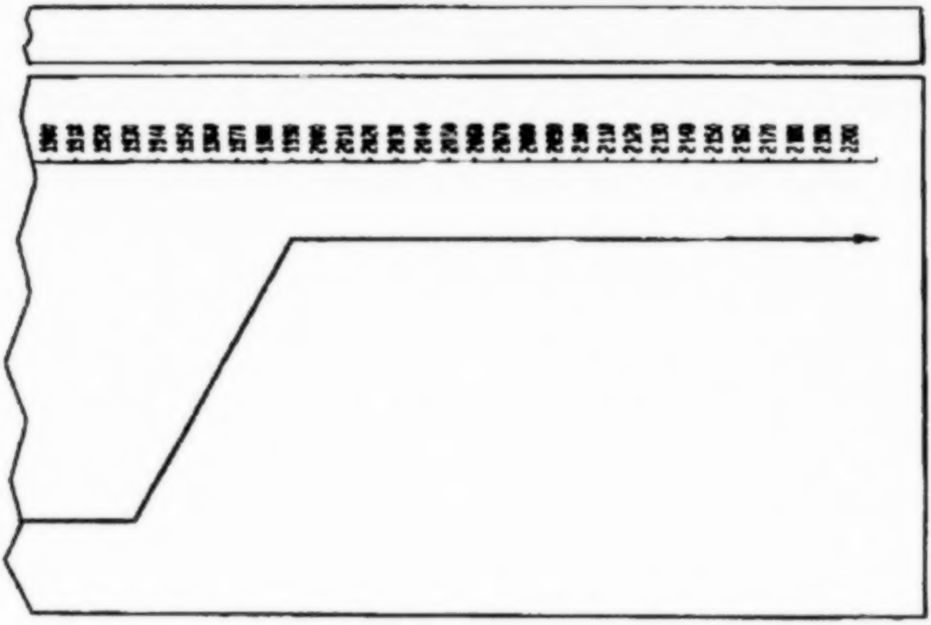
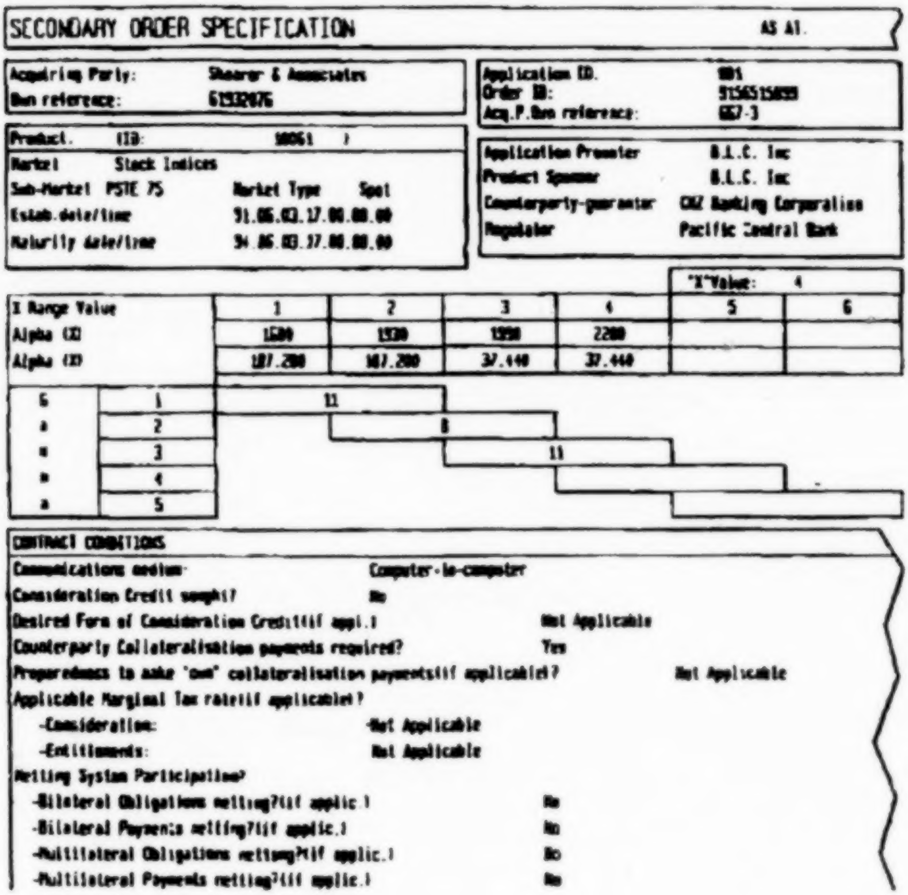


FIG. 67



SECONDARY ORDER SPECIFICATION AS A1.

Acquiring Party: Shearer & Associates
Own reference: 61932076

Application ID. 001
Order ID: 9156515099
Acq.P.Own reference: 667-3

Product. (ID: 10061)
Market Stock Indices
Sub-Market FSTE 75 Market Type Spot
Estab.date/time 91.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CBZ Banking Corporation
Regulator Pacific Central Bank

"X"Value: 4

X Range Value		1	2	3	4	5	6
Alpha (1)		1500	1930	1990	2200		
Alpha (2)		107.200	107.200	37.440	37.440		
G	1	11					
a	2		8				
m	3			11			
m	4						
a	5						

CONTRACT CONDITIONS
Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? Yes
Preparedness to make "own" collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 67 CONT.

53.06.06.00.00.00.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	50.000	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an EV/CE regime

SPECIAL DEAL TYPE: Collateralisation Payments

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading
Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-502025-046752-0 (and 1)
Desired date/time of Order Submission: Immediate
Desired Order retention perid: 00.00.01.00.00.00
Desired Max.time for counterparty
manual order approval(if applic.): Not Applicable

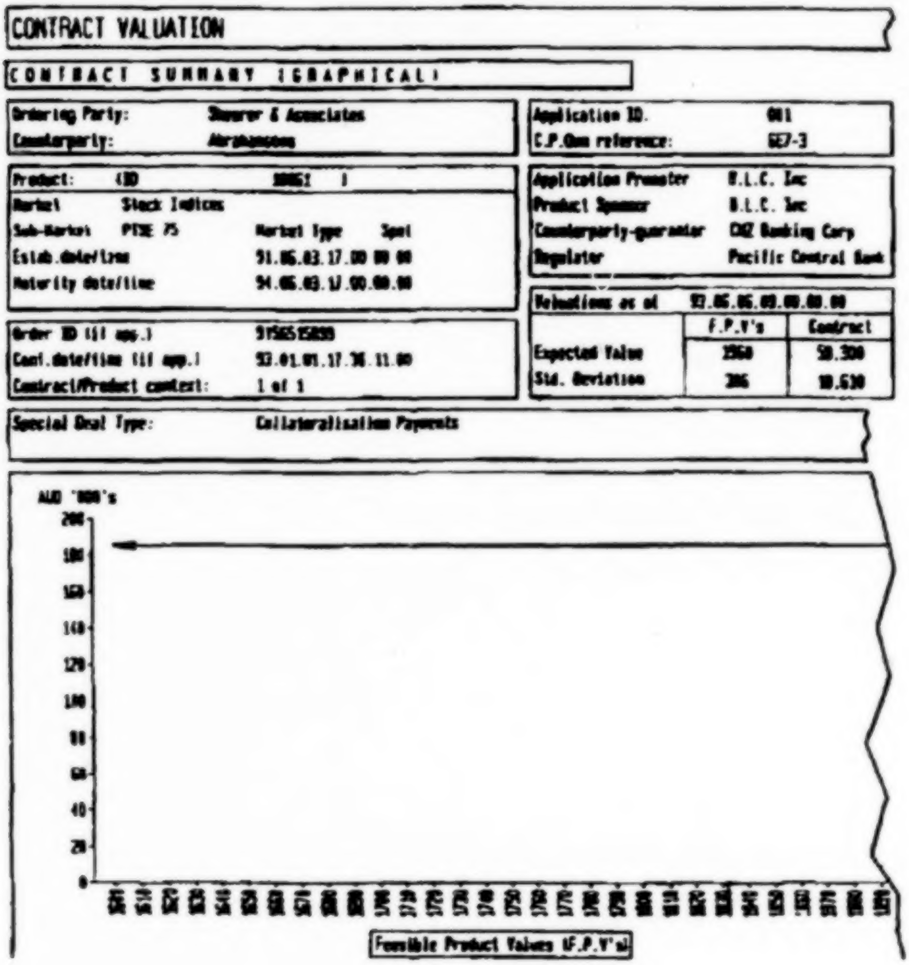
Preferred/Preferential Dealing:

NIL

Unacceptable Counterparties and Other Stakeholders

NIL

FIG. 68



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Shearer & Associates
Counterparty:	Abrahamsons

Application ID.	001
C.P.Ons reference:	6E7-3

Product: (ID 10051)

Market	Stock Indices		
Sub-Market	FTSE 75	Market Type	Spot
Estab.date/time		91.05.03.17.00.00.00	
Maturity date/time		94.05.03.17.00.00.00	

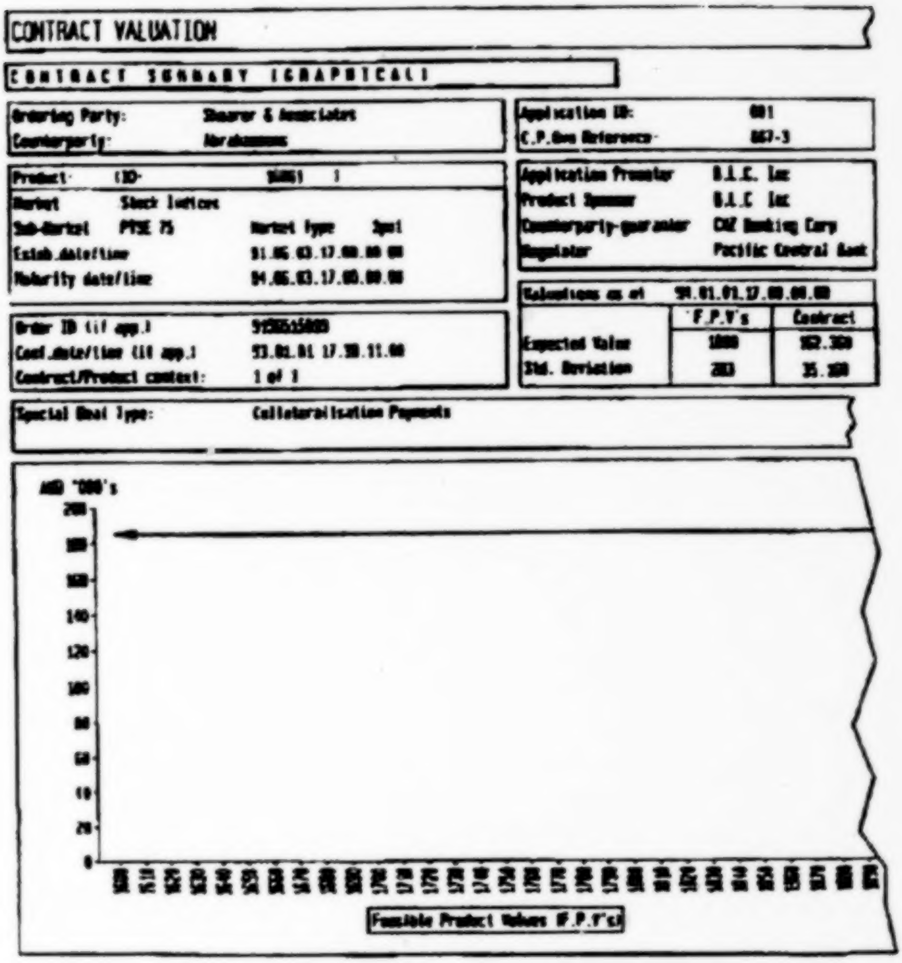
Application Promoter	R.L.C. Inc
Product Sponsor	R.L.C. Inc
Counterparty-guarantor	CHZ Banking Corp
Regulator	Pacific Central Bank

Order ID (if app.)	9156515899
Conf.date/time (if app.)	93.01.01.17.36.11.00
Contract/Product context:	1 of 1

Valuations as of	93.05.06.09.00.00.00	
	F.P.V's	Contract
Expected Value	1960	50.300
Std. Deviation	306	10.630

Special Deal Type: Collateralisation Payments

FIG. 69



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Shearer & Associates
Counterparty:	Abrahamsons

Application ID:	001
C.P.Gen Reference:	067-3

Product: (ID: 10051 1)

Market	Stock Indices		
Sub-Market	FTSE 75	Market Type	Spot
Estab. date/time		91.06.03.17.00.00.00	
Maturity date/time		94.06.03.17.00.00.00	

Application Promoter	B.I.C. Inc
Product Sponsor	B.I.C Inc
Counterparty-guarantor	CAZ Banking Corp
Regulator	Pacific Central Bank

Order ID (if app.)	9150515000
Conf. date/time (if app.)	93.01.01 17.30.11.00
Contract/Product context:	1 of 1

Valuations as at 94.01.01.17.00.00.00

	F.P.V's	Contract
Expected Value	1000	182.300
Std. Deviation	283	35.100

Special Deal Type: Collateralisation Payments

FIG. 69 CONT.

AS AT 94.01.01.17.00.00.00 Report for. Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50,300	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

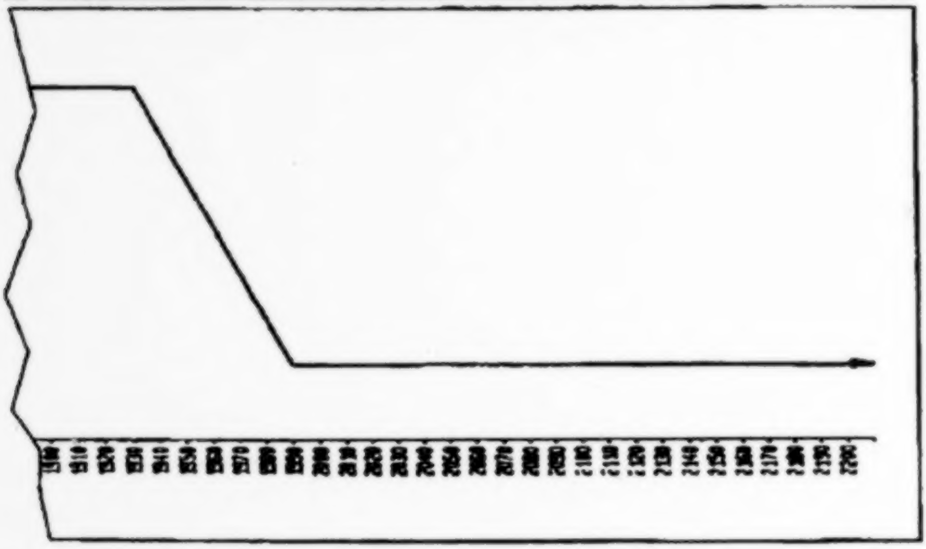
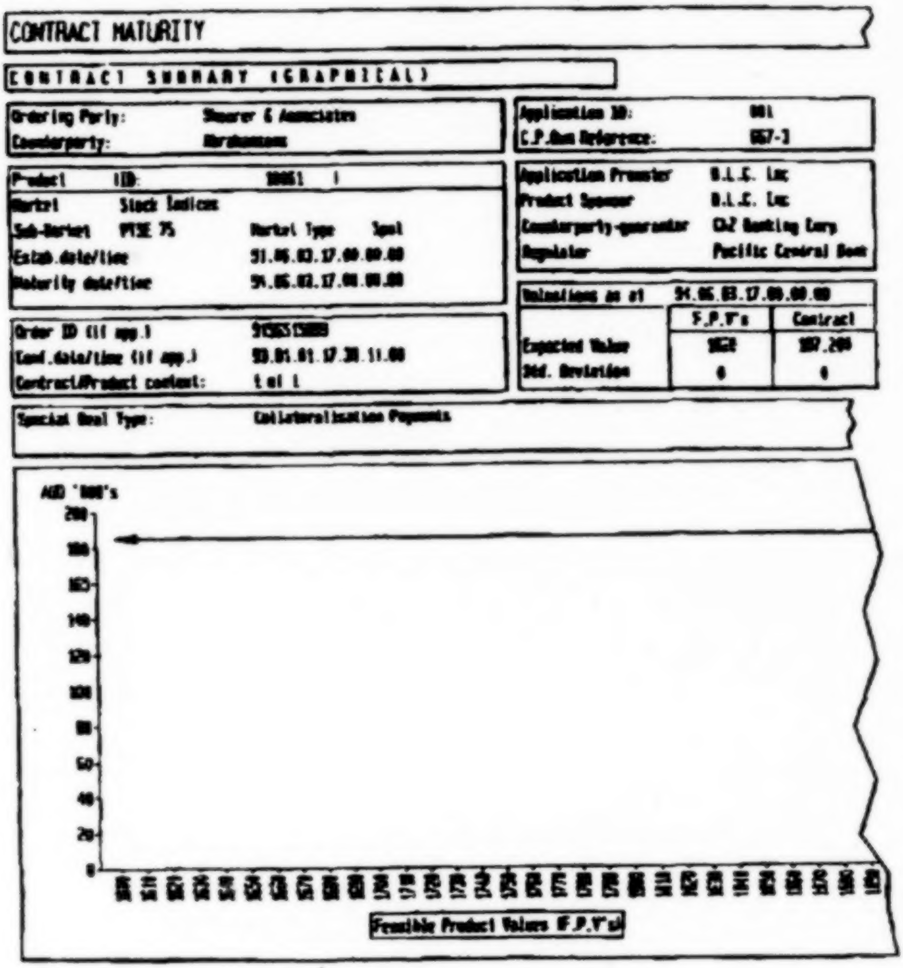


FIG. 70



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Shearer & Associates
Counterparty: Abrahamsons

Application ID: 001
C.P.Own Reference: 667-3

Product ID: 10061 1
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab.date/time 91.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor ChZ Banking Corp
Regulator Pacific Central Bank

Valuations as at 94.06.03.17.00.00.00

	F.P.V's	Contract
Expected Value	187	187.200
Std. Deviation	0	0

Order ID (if app.) 9156515000
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product content: 1 of 1

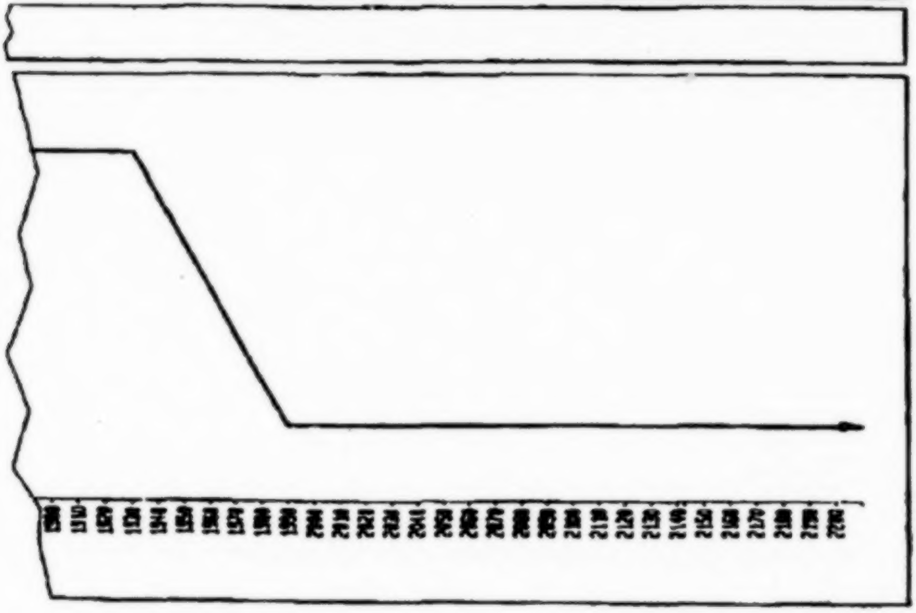
Special Deal Type: Collateralisation Payments

FIG. 70 CONT.

AS AT 94.06 03.17 00 00.00 Report for Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N A.	50.300	As below

Pricing and Matching Process: Minimize pre-tax consideration payout under an EV/CE regime



METHODS AND APPARATUS RELATING TO THE FORMULATION AND TRADING OF RISK MANAGEMENT CONTRACTS

TECHNICAL FIELD

This invention relates to methods and apparatus, including electrical computers and data processing systems applied to financial matters and risk management. In particular, the invention is concerned with the management of risk relating to specified, yet unknown, future events.

BACKGROUND ART

Individuals and enterprises are continually exposed to risk because of future events beyond their control. The outcome of those events can either positively or negatively impact on their wellbeing. Individuals and enterprises should generally prefer not to face exposure to the possibility of adverse consequences, regardless of their perception of the likelihood of such events occurring. It is in their interest to consider foregoing 'resources' they currently possess if doing so would reduce the possibility of being so greatly exposed to future outcomes.

Risk can take many forms in view of the large range and type of future events which might result in adverse consequences. Risk can be categorised, in one instance, as 'economic' in nature. Phenomena that constitute economic risk include: commodity prices, currency exchange rates, interest rates, property prices, share prices, inflation rates, company performance, and market event based indices.

Another characterisation of risk concerns 'technical' phenomena. This can include things like the breakdown of an electricity generation plant, aircraft engine failure, and the damage to, or failure of, orbiting telecommunications satellites. The outcomes for each of these phenomena will be adverse for the users and/or supplier.

Other forms of risk defy ready characterisation, such as weather-based (viz., rain damage or lightning strike), or other natural occurrences (viz., earthquakes or iceberg collision with sea-going vessels).

There are also less tangible risks associated with, for example, the emission of atmospheric pollutants or the disposal of intractable toxic wastes, in the sense that the future consequences are unknown, save that there is a notion, based on current information, that they could be adverse.

The capability to manage risk is more important today than it was in the past, and is likely to become ever-more important into the future, because there is an ever increasing exposure to a wider generic range of future phenomena beyond the control of individuals or enterprises. There is also a wider feasible range of possible future events, and greater uncertainty about the likelihood of occurrence, associated with any single future phenomenon viz., an increasing volatility.

It is also thought that individuals are now more risk-averse in recessionary times, when there are fewer available discretionary resources to trade-off to protect themselves from such adverse future events.

In the prior art, individuals and enterprises faced with 'technical' risk have hedged against future outcomes by mechanisms such as the adoption of quality assurance practices, warranties, increased research and development activity (and associated intellectual property rights such as patents, utility models and registered designs), the purchase of modernised plant and equipment, and improved inventory, occupational health and safety and employer/employee relations practices.

Consider a manufacturer of, say, integrated circuits (ICs), which has many clients wishing to purchase its ICs. The demand may result in a delay in delivery due to limited manufacturing capacity, thereby requiring advance production scheduling for orders already in-hand. Typically, the manufacturer will give a warranty to a purchaser as to measurable performance criteria for its ICs; if a batch does not perform to the specified criteria, the manufacturer is required by contract to replace that batch. That is, a purchaser may have no interest in obtaining monetary compensation for the poor quality ICs, as the purchaser needs the components for their own products. In that case, the 'consideration' the warranty makes is the priority scheduling of a substitute batch of that type of IC, possibly displacing other scheduled production runs, or deferring delivery to another purchaser.

Such contractual arrangements are piece-meal in nature, and can only be struck between the manufacturer and each individual purchaser. They also leave the manufacturer exposed to claims from other customers whose orders are delayed by the rescheduling. The manufacturer has no convenient mechanism available to it to hedge against such claims, perhaps by way of reserving production rights with another manufacturer, in lieu of unavailability of their own manufacturing facility.

In the face of such 'economic' risk, it is known for individuals and enterprises to hedge against adverse outcomes by indirect means such as self-insurance, and directly by means such as futures contracts, forward contracts, and swaps.

There are disadvantages or limitations associated with such available economic risk management mechanisms. Particularly, they provide, at best, only indirect approaches to dealing with the risk management needs. The available mechanisms are relatively expensive, and provide limited phenomenon coverage, and therefore cannot meet the requirements of the party seeking to hedge against such wide-ranging future risk. The infrastructure and pay-out costs associated with switching between, say, a commodities market and a stock market are often prohibitive for entities small and large alike. As a consequence, entities find themselves saddled with obligations they have little control over and cannot escape.

In respect of the "less tangible" forms of risk, an example in the prior art of a form of management of that risk is that of 'pollution rights' sold by the U.S. Environmental Protection Agency (EPA) in March 1993 for the atmospheric emission of sulphur dioxide. This was done by an auction of "allowances" permitting the release into the atmosphere. By the year 1995, any company or organisation emitting sulphur dioxide in the U.S. without enough allowances to cover their total emissions will face prosecution. This means polluters must either buy further allowances, or else modify or replace their plant and equipment to reduce these emissions. The EPA will regulate the total number of allowances able to be obtained. The existing allowances have already become a valuable tradeable 'property' as between sulphur dioxide emitters, that is, even before the time when no further allowances will be able to be purchased.

Management techniques for the "less tangible" forms of risk are in their infancy. The existing forms indicate an emerging demand for systems and methods to enable effective management.

Specific examples in the prior art of patents relating to methods and apparatus which deal with various forms of risk management include British Patent No. 2 180 380, in the name of Merrill Lynch Pierce Fenner and Smith Incorporated, directed to an Automated Securities Trading Apparatus (corresponding to U.S. Pat. No. 4,674,004, and further related to U.S. Pat. Nos. 4,346,442 and 4,376,978). Other examples include U.S. Pat. No. 4,739,478 assigned to Lazard Freres and Co., directed to Methods and Apparatus for Restructuring Debt Obligations, U.S. Pat. No. 4,751,640 assigned to Citibank, N.A., directed to An Automated Investment System, and U.S. Pat. Nos. 4,752,877, 4,722,055, and 4,839,804 assigned to College Savings Bank directed to Methods and Apparatus for Funding Future Liability of Uncertain Cost.

The present invention comes about in view of the shortcomings of existing risk management mechanisms, and the perceived increasing importance of the management of risk relating to specified, yet unknown, future events.

In this sense, the invention is directed to something having economic value to individuals, enterprises and societies as a whole. Methods and apparatus that provide for the management of risk offer material advantages by, for example, minimising adverse future outcomes, providing both a form of compensation in the event of adverse future outcomes, and forms of risk management not otherwise supported or available in the prior art, and thus have value in the field of economic endeavour.

DISCLOSURE OF THE INVENTION

The invention encompasses methods and apparatus enabling the management of risk relating to specified, yet unknown, future events by enabling entities (parties) to reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent on the occurrence of the specified future events. The entities submit such orders to a 'system' which seeks to price and match the most appropriate counter-party, whereupon matched contracts are appropriately processed through to their maturity.

Therefore, the invention enables parties to manage perceived risk in respect of known, yet non-predictable, possible future events. These future events may relate to measurable phenomena whose outcome is verifiable, and cannot be materially influenced by any other entity having a stake in that outcome.

The ability to price and match risk aversion contracts essentially comes about because of the nature of risk itself. Any number of people will each have differing views as to the likelihood of an outcome of some future event. This means that when each person is required to independently assess a range of outcomes for a specified future date, there almost always will be a variance in those assessments. Thus it is possible to match these expectations as between parties to form a contract. The potential counter-parties to an offered contract have the motivation of taking up an opportunity to exploit differing views of future outcomes to their advantage, either for some gain or, again, as a form of risk management.

It is important that the assessments as to future outcomes of events are made independently of any other party who could be a counter-party to a contract. The nature of the pricing and matching, therefore, is totally different to conventional negotiation or bidding as between parties.

The present invention enables entities to better manage risk, as they are able to think more explicity about possible future events beyond their control which they perceive will have adverse consequences for them. They will have the capacity to utilise existing resources to reduce exposure to a specific risk, and have access to a generally available mechanism by which they can explicity trade-off existing assets for increased certainty about the future. They are also free to decide upon the degree to which they should make such trade-offs, and to actually effect and subsequently manage such trade-offs in a simple and low cost manner.

The present invention also provides an automated infrastructure to which parties have access without restrictions relating to nationality or residential requirements. This allows the parties to participate directly without requiring an intermediary.

Therefore, in accordance with one aspect of the present invention, there is disclosed a data processing system to enable the formulation of multi-party risk management contracts, the system comprising:

> at least one stakeholder input means by which ordering stakeholders can input contract data representing at least one offered contract in at least one predetermined phenomenon, each said phenomenon having a range of future outcomes, and said contract data specifying a future time of

maturity, entitlements due at maturity for the range of outcomes, and a consideration due to a counter-party stakeholder;

at least one counter-party stakeholder input means by which at least one counter-party stakeholder can input registering data as to a respective view of the outcomes in said predetermined range of outcomes in the future for one or more of said predetermined phenomena;

a data storage means linked with each said stakeholder input means and linked with each said counter-party stakeholder input means to store said contract data and said registering data: and

data processing means, linked with the data storage means, for pricing and matching contracts from said contract data and said registering data, said pricing including selecting the registering data corresponding to the time of maturity for each predetermined phenomenon and calculating a counter-consideration derived from said entitlements, and said matching including comparing said consideration and said counter-consideration to match an offered contract with at least one of said counter-party stakeholders.

In accordance with a second aspect of the present invention there is disclosed a method to enable the formulation of multi-party risk management contracts, the method comprising the steps of:

(a) inputting into data processing apparatus, by at least one ordering stakeholder input means thereof, contract data representing at least one offered contract in at least one predetermined phenomenon having a range of future outcomes, and said contract data specifying a future time of maturity, entitlement due at maturity for the range of outcomes, and consideration due to a counter-party stakeholder;

(b) inputting into said data processing apparatus, by at least one counter-party stakeholder input means thereof, counter-party registering data as to a respective view of each outcome in said predetermined range of outcomes in the future for one or more of said predetermined phenomena;

(c) storing, in a data storage means of said data processing apparatus linked with each said stakeholder means and linked with each said counter-party stakeholder input means, said contract data and said registering data; and

(d) pricing and matching at least one of the offered contracts, by data processing means of the data processing apparatus linked with said data storage means said pricing and matching comprising the steps, for each offered contract, of:

  (i) selecting the registering data corresponding to the time of maturity for a predetermined phenomenon;

  (ii) calculating a counter-consideration derived from the said entitlement;

  (iii) comparing the said consideration and the said counter-consideration; and

  (iv) matching a contract on the basis of the said comparison.

In preferred embodiments, the ordering stakeholders and counter-party stakeholders can be considered to be contract buyers and contract sellers respectively. The entitlement for each outcome can be in the form of 'money' payoffs (both positive and negative) at maturity of a matched contract, or can be other types of compensation, possibly in the form of goods, services, promises, credits or warrants. The consideration, whether buyer specified or seller calculated, can again be in the nature of a premium or payments, or can relate to other 'non-money' forms of property or obligations, typically transferable when a contract is matched, although possibly deferable, until, and potentially beyond, the time of maturity.

In the period between the match of a contract and maturity the various buyers, sellers and other contract stakeholders can review any contract to which they are a party and seek to trade that contract to other parties by the pricing and matching procedure, or variations on the pricing and matching procedure. They would tend to do so if their view of the future outcome of the phenomenon, being the subject of the contract, had changed markedly, or as a means to minimise expected losses if some unforseen adverse trend in the present day outcome of the phenomenon has occurred. As well as trading existing contracts, further contracts can be offered to 'lay off' or avert risk. Stakeholder parties can build up a portfolio of matched contracts and offered contracts, which are continually traded to obtain the best possible position at any time, and that position can be continually reviewed with time.

It is further possible for offered contracts to be based on the difference between phenomena, and so manage perceived risk as between the phenomena. Elemental contract phenomena can therefore be developed to meet the most particular needs of buyers and sellers, thus creating great flexibility.

In most instances the date of maturity will be predetermined by a 'product sponsor' stakeholder, who otherwise cannot be a buyer or seller of contracts they sponsor. Even so, it is conceivable that the date of maturity can be tied to a specified time from the instant a contract is matched. This may be appropriate where the time of maturity is in the near future, in which case offered contracts could otherwise remain unmatched following initial offer even up until the time of maturity.

Other stakeholders have executive roles in administration, guaranteeing the performance of buyers and seller, regulation, supervision and so on. In this way the number and types of buyers and sellers that can be considered in pricing and matching offered contracts can be controlled.

The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement.

Therefore, in accordance with a further aspect of the invention, there is disclosed a method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

(a) creating a shadow credit record and debit record for each party to be held independently from the exchange institutions by a supervisory institution;

(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and debit record;

(c) for every transaction resulting in an exchange obligation, the supervisory institution adjusts each respective party's shadow credit record or debit record, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and

(d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

BRIEF DESCRIPTION OF THE DRAWINGS

A number of embodiments of the invention will now be described with reference to the accompanying drawings, in which:

FIG. 1 shows a block diagram of a generic 'system' embodying the invention;

FIG. 2 shows a block diagram of an indicative hardware platform supporting the system of FIG. 1;

FIG. 3 shows a representation of INVENTCO and its main component parts;

FIG. 4 shows a block diagram of a subset of the components of an INVENTCO system's markets-depository (M-INVENTCO);

FIG. 5 shows a block diagram of the process components of a subset of one type of 'market' (termed CONTRACT APP) which can reside within M-INVENTCO;

FIG. 6 shows a timeline applicable to Example I;

FIG. 7 shows a timeline applicable to Example II;

FIGS. 8 to 16 show flow diagrams of the contract pricing and matching methodology;

FIG. 17 shows a timeline applicable to Example III;

FIGS. 18 to 70 show flow diagrams of the first to ninth process components for a CONTRACT APP; and

FIGS. 41 to 70 show tables and charts associated with Examples I, II and III.

DETAILED DESCRIPTION OF A BEST MODE FOR CARRYING OUT THE INVENTION

1. Introduction

The description firstly discusses the relation of the various users (stakeholders) of the 'system', followed by a consideration of a hardware data processing platform and peripheral input/output devices by which stakeholders interact with each other and the system.

This is followed by a discussion of the scope of the 'applications' that can be supported by the system in relation to the various stakeholders, and the interrelation of component parts thereof.

Details as to software methodologies for implementation of the applications supported by the system are also described, including a number of worked examples relating to the formulation and trading of risk management contracts.

In the course of the detailed description reference is made to a number of non-conventional expressions and terminologies. For convenience, an explanation of these is listed in the Glossary hereinbelow.

2. 'Systems' Configurations

FIG. 1 shows a block diagram of a generic 'system' embodying the invention. The various stakeholders or parties to the system 10 each have access to a centralised processing unit 20. The processing units 20 can be constituted by one or more data processing apparatus, with each one thereof providing access for any one or more of the various stakeholders to applications software supported by the system 10, as all the processing units would be interconnected. Access to the one or more data processing apparatus is controlled by a generic form of communications co-ordination and security processing unit 25.

FIG. 1 also indicates that there are a number of types of stakeholder, and a number of individual stakeholders within each stakeholder type. The basic types of stakeholder are described as: applications promoters 11, product sponsors 12, product ordering parties (buyers) 13, potential product counter-parties (sellers) 14, counter-party guarantors 15, regulators 16, consideration/entitlement transfer ('accounting') entities 17, and miscellaneous parties 18. The detailed roles of each of these stakeholders will be subsequently described in greater detail at a later time. The number of types of stakeholder represented in FIG. 1 is typically the largest that will be supported by the system 10.

An embodiment of a computer system for the system 10 is shown in FIG. 2. The core of the system hardware is a collection of data processing units. In the embodiment described, the processing unit 20 comprises three inter-linked data processors 93,97,104, such as the Sun 670 MP manufactured by Sun Microsystems, Inc. of the USA. Each processing unit 93,97,104 runs operational system software, such as Sun Microsystems OS 4.1.2, as well as applications software. The applications software is, in part, written around the flow diagrams subsequently described in FIGS. 8 to 16, and FIGS. 18 to 40, and accesses, or otherwise creates, the data files as summarised in the section headed PROCESS 2 VARIABLES AND DATA FILES hereinbelow. The processor configuration shown in FIG. 1 represents a large system designed to handle the transactions of thousands of stakeholders, the input and output data generated by those stakeholders, and risk management contract pricing, matching and subsequent processing functions.

Each processing unit 93,97,104 is operably connected with it one or more mass data storage units 95,100,110 to store all data received from stakeholders, and other data relating to all other software operations generating or retrieving stored information. Suitable mass storage units are, for example, such as those commercially available from Sun Microsystems.

A number of communications controllers 80,84,87, forming the communications co-ordination and security processing unit 25, are coupled with the processing unit 20. These controllers effect communications between the processing units 93,97,104 and the various external hardware devices used by the stakeholders to communicate data or instructions to or from the processing units. The communications controllers are such as the Encore ANNEX II, the IBM AS/400 server or the CISCO Systems AGS +.

A large range of communications hardware products are supported, and collectively are referred to as the stakeholder input/output devices 70. One amongst many of the communication devices 70 are personal computers 51 and associated printers 52, which have communications connection with the communications controller 80 by means of a modem 50. There can also be an external host device 53, such as a mini or mainframe computer, again linked with the communications controller 80 by means of a modem 54. In other forms, communications can be established simply by means of a tone dialing telephone 56, which provides for the input of instructions or data by use of the tone dialing facility itself. In the alternative, a voice connection via an operator 75 can be effected by a conventional telephone 58. Both these external devices are shown connected with the communications controller 84. A further possibility is to have data transfer by means of a facsimile machine 65, in this case shown linked to the communications controller 87.

In all cases, users of the input devices are likely to be required to make use of system access password generation and encryption devices such as the Racal RG 500 Watchword Generator 66,67,68,69, (for personal use) and the Racal RG 1000, which is incorporated in a mainframe computer 53. The corresponding decoding units for these devices are incorporated in the communications controllers 80,84,87.

The generic processing unit 20 also includes a large number of 'portable' information recordal devices, such as printers, disc drives, and the like, which allow various forms of information to be printed or otherwise written to storage media to be transferable. This is particularly appropriate where confirmatory documentation of matched risk contracts is required to be produced, either for safekeeping as a hard copy record, else to be forwarded to any one or more of the stakeholders that are a party to each individual matched contract.

The generic system 10 shown in FIG. 1 encompasses many varied configurations, relating not only to the number and types of stakeholders, but also the 'architectures' realisable by the system hardware and software in combination. In that sense the arrangement shown in FIG. 2 is to be considered only as broadly indicative of one type of hardware configuration that may be required to put the invention into effect.

The 'virtual' level of the system 10 is termed INVENTCO. INVENTCO is a collection of one or more potentially interrelated systems, as shown in FIG. 3. Each INVENTCO system (INVENTCO SYSTEM #1 . . . INVENTCO SYSTEM #N) enables the formulation and trading of a wide range of contractual obligations, including risk management contracts. The hardware configuration shown in FIG. 2, is to be understood both as a realisation for a single INVENTCO system, and equally can represent a number of INVENTCO SYSTEMS, where the processing unit 20 is common to all and supports a number of communications coordination and security units 25, others of which are not shown, together with associated external communications devices 70, also not shown.

While INVENTCO allows the formulation and trading of risk management contracts, it is also responsible for processing of such contracts through to, and including, their maturity, and in some respects, subsequent to maturity.

Where there are a number of INVENTCO systems, those systems may be inter-dependent or stand-alone in nature. If inter-dependent, INVENTCO (10) is responsible for transactions between those systems.

INVENTCO and all of its component parts can be legally or geographically domiciled in separate countries or states. The supra-national nature of INVENTCO enables the stakeholders to avail themselves of the risk management mechanisms independently of legal domicile or other such restrictions that are often a feature of some conventional risk management mechanisms, subject to meeting certain criteria regarding credit worthiness and such. Indeed, the legal domicile, location, ownership and participating stakeholders of INVENTCO, or any of the sub-systems, can be continually changing.

FIG. 3 further shows that each INVENTCO SYSTEM comprises an infrastructure component, termed I-INVENTCO, and a markets depository component M-INVENTCO. I-INVENTCO is concerned with coordination of communications and other security considerations, that part termed AXSCO, and also provides a network and general management system, termed VIRPRO. M-INVENTCO is a depository of authorised product-market (applications) software residing within INVENTCO under the authorisation of VIRPRO, and as distributed using I-INVENTCO.

One or more local or wide area telecommunication networks may link VIRPRO and M-INVENTCO to AXSCO, and thus to each other. In this way both VIRPRO and M-INVENTCO effectively reside around AXSCO.

AXSCO therefore comprises multiple, uniquely addressed communications controllers linked together in a number of possible ways. In one embodiment, AXSCO is represented by the communications coordination and security processing unit 25 shown in FIG. 2. The component hardware, such as the three controllers 80,84,87 shown in FIG. 2, typically are responsible for three types of operational applications. The first is in respect of time stamping data received from other parts of INVENTCO and data similarly transmitted to entities external of INVENTCO. The second is in respect of protecting the identity and/or location of entities within INVENTCO from one another, and from entities external to INVENTCO. The third is responsible for overall management of the routing of data received and to be transmitted within INVENTCO and to external entities thereto.

Referring now to FIG. 4, within M-INVENTCO reside different collections of system sponsored phenomena or 'markets', one collection of which is termed CONTRACT APPS. Each CONTRACT APP within the CONTRACT APPS 'markets' collection is essentially related to a specific type of risk management phenomenon. The purpose of individual CONTRACT APPS is two-fold. First, to effect the trading/exchange/transfer of risk management contracts (and derivatives of these transactions) between participating product ordering parties and counter-parties on terms acceptable to the parties involved, as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trades/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through to their time of maturity.

Individual CONTRACT APPS are responsible for performing the above-described tasks according to the specific rules they embody, defined by their applicable stakeholders.

The role played by the various stakeholders to CONTRACT APPS, remembering that in many cases it would not be necessary to have the involvement of all the possible types of stakeholder, briefly stated is as follows:

(a) An application promoter is an entity having overall responsibility for the functioning of a CONTRACT APP, having being granted that responsibility by VIRPRO.

(b) A product sponsor is an entity which promotes and administers the rules of trading, and subsequent management of defined "products" selected for inclusion in a CONTRACT APP by its application promoter.

(c) An ordering party (buyer) is an entity seeking to acquire a CONTRACT APP product from a potential counter-party (seller).

(d) A counter-party (seller) is an entity potentially prepared to satisfy the CONTRACT APP product needs of an ordering party (buyer).

(e) A guarantor is an entity guaranteeing a seller's ability to settle or meet obligations as a result of a CONTRACT APP effected match.

(f) Regulators are entities overseeing the on-going performance of all other stakeholders involved in a CONTRACT APP, and especially guarantors.

(g) Consideration/entitlement transfer ('accounting') entities are those parties with which all other CONTRACT APP stakeholders maintain 'accounts' to transfer required considerations/entitlements to or from each other.

(h) Other miscellaneous parties are those having some other defined stake in the functioning of a CONTRACT APP.

In any implementation of the system, multiple numbers of each form of stakeholder are accommodated. A detailed consideration of the nature of CONTRACT APPS and the types of stakeholders to a CONTRACT APP is given in the section headed CONTRACT APPS hereinbelow.

As shown in FIG. 5, any one CONTRACT APP consists of a cluster of nine (and potentially more, or fewer) specific processes, these include:

(a) a process handling file administration and updating tasks supporting all other processes (termed Process 1);

(b) a process handling the receipt and processing of "primary" risk aversion contract transactions (termed Process 2);

(c) a process handling the receipt and processing of "secondary" risk aversion contract transactions (termed Process 3);

(d) a process handling the receipt and processing of "derivative-primary" risk aversion contract transactions (termed Process 4);

(e) a process handling the receipt and processing of "derivative-secondary" risk aversion contract transactions (termed Process 5);

(f) a process handling the "back office" management of all four types of risk aversion contract transactions, and transactions handled by Processes 7 to 9 (termed Process 6);

(g) a process handling non-CONTRACT APP-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7);

(h) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to specialist systems to assist the stakeholder concerned to decide how best to interface with a defined element of INVENTCO (termed Process 8); and

(i) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to a range of INVENTCO-facilitated "value added services" (termed Process 9).

A detailed discussion of the nine CONTRACT APP processes is given in the second headed DESCRIPTION OF CONTRACT APP PROCESSES hereinbelow.

All these processes collectively access multiple data files and multiple records within these files. A description of the variables and data files used by Process 2, a key component process of a CONTRACT APP, is provided in the second headed PROCESS VARIABLES AND DATA FILES hereinbelow.

The foregoing description identifies the essential inter-reaction between the hardware platform and the applications computer software run thereon.

A first example of the life-cycle of a risk management contract will now be described. A further detailed discussion of the nature of risk management contracts is given in the second headed RISK MANAGEMENT CONTRACTS hereinbelow.

3. Life Cycle of Risk Management Contract: Example I

The first example of a risk management contract describes a contract to manage risk associated with faults in microprocessors. In summary, the example shows how the system could enable one party, such as a supplier of military standard equipment seeking to avoid the adverse consequences of faulty microprocessors (specifically, 64-bit microprocessors) used in that equipment to make a contract with another party, such as a manufacturer of these microprocessors, who is seeking to exploit an opportunity based on their view of the future incidence of faults in the microprocessors they produce.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to "exclusive production warrants" (XPWs). That is, warrants providing the holder with priority access to a specified quantity of replacement and additional microprocessors sourced, immediately, from a defined, different, guaranteed high-quality, production line available to the supplier in consideration of payment of a money amount. The XPW entitlement is contingent on the value, at contract maturity date, of a percentage index of the proportion of 64-bit microprocessors shipped by the manufacturer, during a specified prior period, which are subsequently determined to be faulty to a defined degree. The defined degree, in this case, is the microprocessor being fault-free, as determined by successful completion of self-tests.

In this example, the relevant key stakeholders are: an application promoter (Demdata Inc); various product sponsors (the relevant one for the example being Demdata Inc itself); various primary product ordering parties (the relevant one for the example being Denisons); a single potential counterparty (Demdata Inc again); and an application regulator (the Department of Defence).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement is shown in FIG. 6. FIGS. 41–48 are eight detailed explanatory charts supporting FIG. 6. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with chart FIG. 41, it can be seen that Demdata Inc established a Contract APP (Application ID 100) on 92.02.10.17.00.00 (that is, in inverse order, 5 pm on Feb. 10, 1992) to deal with defect liability management. Application ID 100 supports a range of products (Applicable Product ID's 1200–1250).

Looking at the second step in the timeline (Product Specification) in conjunction with chart FIG. 42, it can be seen that Demdata was also Product Sponsor of Product 1210 at the same time (92.02.10.17.00.00). This Product relates to the market termed: Factory Output Quality Indices, and to the sub-market termed 64-bit Microprocessor Fault Tolerance Index. The maturity date for Product 1210 is 95.02.10.17.00,00.00. The consideration for a specific contract involving Product 1210 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is in the form of Exclusive Product Warrants (XPWs); these entitle the contract ordering party to priority access over the forward production capacity of a defined, guaranteed-high-quality, 64-bit microprocessor production line. Product 1210 specifies a range of 0% to 100% in 2% increments in respect of the sub-market outcomes.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), it can be found that Demdata is acting as the sole potential counterparty for forthcoming primary product orders dealing with Product 1210. At this point in the timeline (93.07.01.14.00.00.00), 17 months after the specification of Product 1210, Demdata has currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with chart FIG. 43, it can be seen that an Ordering Party, Denisons, is seeking a contract (from the offering party, Demdata) in Product 1210 at that time (93.07.01.14.25,30.00), chart FIG. 43 shows the specific 'pay-off' parameters that Denisons has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration (premium) amount of 32,000 (denominated in commercial bank. Australian dollars).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with chart FIG. 44, it can be seen that Demdata (using the specified pricing parameters set at 93.07.01.14.00.00.00) prices the Denison order at 93.07.01.14.26.40.00, Demdata's pricing parameters indicate that their appropriate Defined Circumstances ID for Denisons is 14. As is shown, this ID in turn implies a Commission Rate of 1.10%, a Discount Rate of 9.90%, a particular set of Component product prices and a particular set of Assessed Probabilities of occurrence over the range of feasible product values (outcomes).

The Contract Bid Price is calculated automatically by the application software in the following manner: The ordering party-specified desired contingent entitlement amounts, i.e. the "registered data", (covering the feasible product definition value range) are multiplied by the potential counterparty-specified component product prices (which will rarely add to "1" because each counterparty is endeavouring to 'game' potential ordering parties in different ways) to yield the corresponding number of implied contingent entitlement amounts. When added together, these figures sum to (34.110), where the brackets signify a negative value. This figure represents an expected future counterparty-entitlement payout amount (as at the designated contract maturity date of 95.02.10.17.00.00). The present day value of this figure, calculated using the specified discount rate of 9.90% per annum, is 29.220. To this amount is added the potential counterparty's desired flat commission amount of 1.10%, yielding a contract Bid Price (in the consideration/entitlement denomination of the product, commercial bank-denominated Australian dollars) of 29,540. No exchange rates are applicable in this case, because the ordering party, Denisons, is not seeking to deal in a consideration or entitlement denomination different to the denominations formally specified for the product. Demdata's parameters calculate that a consideration bid price of 29,540 will yield them a base margin on the contract of 3,180 (again denominated in commercial bank, Australian dollars).

This margin amount is calculated in the following manner: The ordering party-specified desired contingent entitlement amounts (covering the feasible product definition value range) are multiplied by the potential counterparty-specified assessed probabilities of occurrence to yield a corresponding number of net contingent entitlement valuation amounts. When added together, these sum to (30.770). This amount represents an expected future counterparty-entitlement loss-on the contract (as at the designated contract maturity date of 95.02.10.17.00.00). The present value of this amount, calculated using the specified discount rate of 9.90% per annum, is 26,360. Thus, (ignoring for this example the margin Demdata may gain from using, in some manner, the consideration amount of 29,540 through to the time the contract expires, and various transaction fees) the margin Demdata can expect from entering into this contract with Denisons is their calculated present-value indifference price of 29,540 less their calculated present-value expected loss on the contract of 26,360 (or 3,180).

The amounts in the last two rows of the table of FIG. 44 are used for checking that this contract, if entered into by Demdata, will not result in them violating any self imposed portfolio valuation or composition limits. This notion is explained in detail in Example III.

Looking at the sixth step in the timeline (Order Matching), it can be found that Demdata's contract bid price of 29,540 is below Denison's specified maximum consideration price of 32,000, leading to a matching of the order at 93.07.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be soon to take place twelve minutes later at 93.07.01.14.38.50.00, after the system has determined that Denisons is able to (and then does) immediately pay the required consideration funds amount of 29,540 to Demdata.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIG. 45, it can be seen that a contract valuation report for Denisons was published not much longer than one hour after confirmation of the contract, that is, at 93.07.01.16.00.00.00. As can be seen, the market estimate of the future product value of the 64BMFT Index at this moment is 38 (with a standard deviation of 4), which implies that this contract has an expected future value of 29.330 XPWs (with a standard deviation of 6,213).

On FIG. 46 it can be seen the equivalent report for Demdata Inc of their expected future entitlement payout is identical to Denisons' expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts). The above-described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The ninth stop in the timeline (Contract Valuation) refers to a contract valuation report published for Denisons sixteen months later, at 94.11.15.10.0.00.00 (see FIG. 47). As can be seen, the market estimate of the future product value of the 64BMFT index at this moment is 58 (with a standard deviation of 5), which implies that this contract now has an expected future value of 42,160 XPWs (with a standard deviation of 6,209). This is an increase in expected future value of 12,830 XPWs for Denisons since the former valuation date/time.

The tenth step in the timeline, Contract Maturity, refers to the actual determination of the product value at time of maturity, 95,02.10.17.00.00.00. As can be seen on FIG. 48, this product value of the 64BMFT index was specified by Demdata (as Product Sponsor) to be 74, implying a contract value of 100,660 XPWs to

Denisons and a corresponding obligation on Demdata. The amount of 74 represents the percentage of 64-bit microprocessors shipped by Demdata, during a specified period some time before the designated contract maturity date, which are subsequently determined (possibly by the application regulator, The Department of Defence) to be faulty.

The eleventh step in the timeline involves the formal assignment of 100,660 XPWs by Demdata to Denisons (ignoring possible fee payments by one or both parties).

4. Life cycle of Risk Management Contract: Example II

The second example describes & risk management contract associated with the utilisation of telecommunications carrying capacity. In summary, the example shows how the system could enable one party (a telecommunications carrier) seeking to avoid the adverse consequences of under and over-committing their call carrying capacity between specified points (say, between the two cities, Now York and Boston) to make a contract with another party (say, another telecommunications carrier with call carrying capacity between the same two cities) similarly prepared to hedge against the consequences of this occurring.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to transmission time units between the hours 1200–1800 daily on the NY–Boston link within a defined future period (termed, Prime TTU's) upon assignment by the ordering party—to the counterparty—of a calculated consideration amount of Prime TTUs on the ordering party's own NY–Boston line within another defined future period (these defined TTUs may or may not be convertible to TTUs on other city links). The TTU entitlement is contingent on the value, at contract maturity date, of the log of the difference between the ordering party's utilisation of the counterparty's network and the counterparty's utilisation of the ordering party's network, during a specified prior period ending on the contract maturity date.

In this example, the relevant key stakeholders are: an application promoter (Newcom Inc); various product sponsors (the relevant one for the example being Newcom Inc itself); various primary product ordering parties (the relevant one for the example being Basstel Co.): two potential counterparties (Tasnet and Aarcom); and an application regulator (ITT).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 7. FIGS. 49–57 are nine detailed explanatory charts supporting FIG. 7. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIG. 49, it can be seen that Newcom Inc established a Contract APP (Application ID 001) on 93.11.01.17.00.00 (that is, 5 pm on Nov. 1, 1993) to deal with hardware capacity management. Application ID 001 supports a range of products (Applicable Product ID's 2001–2020).

Looking at the second step in the timeline (Product Specification) in conjunction with FIG. 50, it can be seen that Newcom Inc was also Product Sponsor of Product 2001 at the same time (93.11.01.17.00.00). This Product relates to the market termed Telecommunications Carrying Capacity and to the sub-market termed Prime TTUs. The maturity date for Product

2001 is 96.11.01.17.00.00.00. The consideration for a specific contract involving Product 2001 is in the form of "Ordering Party TTUs". The entitlement is in the form of "Counterparty TTUs"; these entitle the contract ordering party to "transmission time units between the hours 1200–1800 daily on the NY–Boston link (within a defined future period)". The feasible values of PRIME TTUs are normalised in the range of -1.0 to +1.0, respectively signifying the proportionate utilisation of respective networks as between the parties to a contract.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two other carriers, Tasnet and Aarcom, acting as potential counterparties for forthcoming primary product orders dealing with Product 2001. At this point in the timeline (94.06.01.14.00.00.00), 7 months after the specification of Product 2001, both Tasnet and Aarcom have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with FIG. 51, it can be seen that an Ordering Party, Basstel Co., is seeking a contract, from an offering party, in Product 2001 at that time (94.06.01.14.25.30.00). Chart F4 shows the specific parameters (entitlements) that Basstel Co. has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 58,000 (denominated in its own TTUs).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIG. 52, it can be seen that Tasnet (using the specified pricing parameters set at 94.06.01.14.00.00.00) prices the Basstel Co. order at 94.06.01.14:26.40.00. Tasnet's pricing parameters indicate that their appropriate

Defined Circumstances ID for Basstel Co. is 8. As is shown, this ID in turn implies a Commission Rate of 1.00%, a Discount Rate of 9.90% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example I, this results in a Contract Bid Price of 55,180 (denominated in Basstel Co. TTUs), which Tasnet's parameters calculate will yield them a base margin on the contract of 10,760 (again denominated in Basstel Co. TTUs).

Still looking at the fifth step in the timeline, in conjunction with FIG. 53, it can be seen that Aarcom (again using the specified pricing parameters set at 94.06.01.14.00.00.00) also prices the Basstel Co. order at 94.06.01.14.26.40.00. Aarcom's pricing parameters indicate that their appropriate Defined Circumstances ID for Basstil Co. is 9. As is shown, this ID in turn implies a Commission Rate of 0.90%, a Discount Rate of 8.50% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results in a Contract Bid Price of 55,390 (denominated in Basstel Co. TTUS), which Aarcom's parameters calculate will yield them a base margin on the contract of 9,430 (again denominated In Basstel Co. TTUs).

Looking at the sixth step in the timeline (Order Matching) it can be found that Tasnet's price bid of 55,180 is below Aarcom's bid of 55,390 and, in turn, that the 55,180 amount is below Basstel Co.'s specified maximum consideration price of 58,000. This leads to a formal matching of Basstel Co,'s order by Tasnet at 94.06.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be seen to take place nearly ten seconds later at 94.06.01.14.38.50.00, after the system has determined that Basstel Co. is able to (and then does) immediately assign the required consideration amount of 55,180 TTUs to Tasnet.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIG. 54, one can see a contract valuation report for Basstel Co. published about two hours after confirmation of the contract, that is, at 94.06.01.16.00.00.00. As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet's network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.150) (with a standard deviation of 0.023), which implies that this contract has an expected future value of 54,236 Tasnet TTUs (with a standard deviation of 9,207). On FIG. 55 one can see in the equivalent report for Tasnet that their required expected future entitlement payout is identical to Basstel Co.'s expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Contract Valuation) refers to a contract valuation report published for Basstel Co. five months later, at 94.11.22.10.00.00.00 (see FIG. 56). As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet's network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.400) (with a standard deviation of 0.010), which implies that this contract now has an expected future value of 350,181 Tasnet TTUs (with a standard deviation of 74,200). This is an increase in expected future value of 295,945

TTUS for Basstel Co. since the former valuation date/time.

The tenth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 96.11.01.17.00.00.00. As can be seen on FIG. 57, this product value of TTU's was specified by Newcom Inc (as Product Sponsor) to be (0.400), unchanged from the prior valuation date/time, implying a contract value of 368,340 Tasnet TTUs to Basstel Co. and a corresponding obligation on Tasnet. The amount is higher than the prior valuation figure due to the actual determination figure being naturally without a standard deviation element.

The eleventh step in the timeline involves the formal assignment of the 368,340 TTUs by Tasnet to Basstel Co. (ignoring possible fee payments by one or both parties).

5. Primary Product Order Processing

Before describing the third, and most detailed, example, consideration will be given to the 'core' product (contact) ordering, pricing and matching processes. Note that expressions such as (PORD NEW) represent file names.

The flow charts in FIGS. 8 to 16 depict the processing flow of the matching system for primary product orders submitted by ordering party stakeholders to a CONTRACT APP, where this APP is based upon: an EV-CE counterparty pricing regime (assuming paid consideration amounts do not yield an income stream in their own right); a sequential order matching process; consideration/entitlement value dates which are immediately after a product sponsor-designated date/time; and matching rules which do three things: First, identify, for each ordering party's order, a counterparty offering the lowest price bid for an order, subject to this price being at or below the specified maximum price the ordering party has indicated it is prepared to pay. Second, accommodate portfolio expected loss constraints on an 'equivalent maturity date products', 'same-month maturity products', and 'all-products' basis. And third, apply the above-described matching rules on a pre-tax basis, with partial matching of product orders, and without conditional order matching rules.

As shown in FIG. 8, starting at block 610, and proceeding to block 625, the system determines which set of orders to process, authorises these orders, matches them with counterparties where possible, and then confirms them. As shown in blocks 1010 to 1070 in FIG. 9, the system holds newly submitted orders (PORD NEW), and all previously submitted, but as yet unmatched, orders which are defined as queued orders (PORD QUEUE). Parameters and algorithms can be implemented to give the system the ability to determine whether new or queued orders are to be processed at any time. For example, a simplistic algorithm would be to alternate between PORD NEW and PORD QUEUE one order at a time. Another example would be to load queued orders only when there is a change in the counterparty parameters. Test 1020 checks the decision made in block 1010.

For new orders, the system moves to block 1030. Details of the next recorded new order are loaded from the PORD NEW master file (block 1040). The order data fields include: the ordering party identification (BID); the ordering party's own reference (BREF); the product identification (PID) specified by the ordering party; the entitlement "payoff" function type (PAYFUNC); the parameters for the entitlement "pay off" function (PAYPARAM); a "deal type" identifier (DTID); the anonymous and manual deal identifiers (OANON and OMANUAL); the order retention time limit (RET LIM); the maximum consideration the ordering party is prepared to pay (MAXCONSID); the number of the account from which the consideration is to be "paid" (ACC CONSID); and the number of the account to which any entitlement "pay off" amount is to be paid (ACC ENTITL). With this information set, the system's next step is to authorise the order. This occurs at block 1050.

Order Authorisation

Blocks 1100 to 1162 in FIG. 10 provide an expansion of block 1050. Starting at block 1100 the order is assigned a unique identification, which is set in the order data field OID. Before verifying the order, additional information is required by the system. At block 1110, details of the product (order data field PID) are loaded from the master file PPRODUCT (block 1120). The information includes the product maturity date (PMAT); the product consideration/entitlement denomination (PC/ED); the product currency denomination (PCUR) and national currency denomination (PNCUR); and the product limits and parameters (PMIN, PMAX, and PSTEP). The test 1130 checks that the order parameters are consistent with the master file parameters implied by the defined product identification (PID). Orders which fail this test are rejected at block 1140, with details of these orders being stored in the master file PORD REJ (block 1150). In turn, the ordering party is informed of this event (block 1160). Processing then returns to the start of the flow chart (block 1010), ready to load the next order. When an order is authorised, processing continues at block 640.

In the case of a queued order being loaded (block 1060), the order fields are set using the details stored in the queue file PORD QUEUE (block 1070). This data is a combination of new order data (as described in block 1030) and the data loaded/set when the order was originally verified (block 1110). Authorised order processing continues with the order matching process at block 640.

Order Matching

Blocks 1200 to 1616 in FIGS. 11 to 15 provide an explanation of block 640. Orders have retention time limits, stored in the order variable RET LIM. Test 1200 checks that the order retention time has not expired. If it has, the order is rejected at block 1210, with the order details copied to the rejected order file (PORD REJ). The ordering party is then informed of the rejection at block 1230, and processing returns to the main loop via connector "A". If the order is still valid, the order matching process proceeds. The aim now is to find a suitable counterparty (or counterparties) who "prices" the ordering party's "entitlement function" within the limits set by the ordering party. Starting at block 1240, the matching process described is one which seeks to identify, for each ordering party's order, a counterparty offering the lowest "price bid" for an order subject to this price being at or below the specified maximum "price" the ordering party has indicated it is prepared to pay.

Blocks 1300 to 1370 in FIG. 12 provide an explanation of block 1240. The first step is to narrow down a group of counterparties prepared to at least deal with the ordering party. This is described as obtaining the available counterparty short list. First the counterparty short list is wiped (block 1300). Next, the order data fields BID (ordering part identification) and PID (product identification) are used to search the PDEAL LIST master file (block 1320) for all counterparties prepared to consider dealing with the ordering party in the specified product. Any stakeholders who have set a MANUAL or ANON flag are also loaded. For each counterparty selected, SID is set to the corresponding identification. Test 1330 commences a loop which allows every counterparty available to be dealt with in turn. For any currently selected counterparty (with identification set in SID), the data flow proceeds to test 1365. Where the order data field OANON has been set by the ordering party and some stakeholder requires manual confirmation (MANUAL (SID)), the current potential counterparty is not included in the short list. Likewise if the ordering party set OMANUAL and some other stakeholder required anonymity (ANON (SID)). In both cases, data flow returns to test 1330. Otherwise, flow continues at block 1335. At this point, the system determines the applicable "defined circumstances" for the order. It uses the order data fields currently loaded and parameters set in the PSEL DC masterfile (block 1336) to determine this. At block 1340, pricing parameters including consideration/entitlement exchange rates (if applicable), commission rates, and discount rates are selected from the PSEL PRICE master file (block 1350). Using the "defined circumstances" identification (set in DCID) all potential counterparties can have different sets of pricing parameters specified based on any of the order data fields of each order. Test 1360 checks that all the necessary parameters have been found. It is possible that the counterparty, though prepared to deal with the ordering party, does not have a complete set of pricing parameters for the current order specifications. Such a counterparty is not included in the counterparty short list, and processing returns to test 1330. At block 1370, the counterparty is added to the counterparty short list by including the pricing details in the variables: PRICEFUNC(SID), CR(SID), DR(SID), C-C/EDXCHANG(SID), C-CXCHANG(SID), C-NCXC HANG(SID), E-C/EDEXCHANG(SID), E-CXCHANG(SID), E-NCXCHANG(SID), MANUAL(SID), and ANON(SID). Processing then returns to test 1330 where the next selected potential counterparty is dealt with. When all selected potential counterparties have been processed, program flow returns to block 1250. At this point a potential counterparty short list has been obtained.

Blocks 1400 to 1550 in FIGS. 13 and 14 depict block 1250 in more detail, where every potential counterparty has its price offer calculated, based on their individual pricing parameters, for the currently loaded order. At block 1400 a loop commences allowing each potential counterparty in the potential counterparty shortlist to be dealt with in turn. SID is set to the identification of the counterparty currently selected. Test 1410 checks whether any counterparties are left for processing. At block 1420, the potential counterparty's price bid is calculated. Blocks 1490 to 1550 describe this calculation in more detail. At block 1490 the variable, INDEX, is assigned the starting value of the product value range (PMIN). Also, "price" is initialised to zero. Test 1500 commences a loop, where every index point in the product range is traversed. Block 1520 calculates the pricing value returned by the potential counterparty's pricing function, PRICEFUNC, as stored in (PRICEFUNC(SID)), at the current index point, and stores the value in P1. Block 1530 determines the pay-off amount required by the ordering party at the current index point and stores this value in P2. At block 1540, the total price at the current index point is calculated by multiplying P1 by P2. This value is added to the running total stored in PRICE(SID). At block 1550, the index counter (INDEX) is incremented by the product step size (PSTEP), and flow returns to the test 1500. When the end of the product range has been reached (PMAX), flow proceeds to block 1510, where the calculated price bid is modified by the following calculation:

PRICE(SID)-PRICE(SID)V*E-C/EDXCHANG(SID)
*E-CX-CHANG(SID) * E-NCXCHANG(SID)

Returning to block 1430, the price bid stored in PRICE(SID) will be in the applicable product's consideration/entitlement denomination, currency denomination, and national currency denomination. The following steps (block 1430–1470) determine and apply the applicable discount rate to the calculated price bid (currently in future value terms) to yield a price bid in present value terms. This is done as follows: At block 1430 the number of days to product maturity is determined. Block 1440 initialises the loop counter and discount rate divisor. For each day (or appropriate part thereof) between the current date/time and the product maturity date/time, the divisor is changed according to the formula (block 1460):

DIV-DIV * (1+((DR(SID)/100/365))

At block 1470, the price bid is adjusted according to the formula:

PRICE(SID)-PRICE(SID)/DIV

Once the price bid in present value terms is known, the potential counterparty's defined commission is added to the price (block 1480). Given that CR(SID) is a percentage commission rate, the formula is:

PRICE(SID)-PRICE(SID)+((CR(SID)/100) * PRICE (SID))

When test 1410 confirms that every potential counterparty has been priced, program flow continues at 1255.

The test at 1255 checks whether the order was a "quote only" order. If so, flow continues at block 1256 where one or more of the counterparty bid prices are selected. At block 1230, the ordering party is informed of the pricing information gathered. If the order was not a quote order (that is, it was a real product order), an attempt is now made to identify a counterparty from the potential counterparty short list matching the requirements of the current order. This is done at block 1260. Blocks 1560 to 1616 in FIG. 15 describe this process in detail.

Starting at test 1560, a check is made to ensure the potential counterparty shortlist is not empty. If it is, no match is possible and flow continues at block 1612. At this point SID is assigned "0" to indicate that no counterparty was selected from the potential counterparty short list, before moving to block 1614 where the entire order (as no part was matched) is queued. When the list is not empty, program flow continues at block 1570, where the lowest priced counterparty is selected from the counterparty short list. This determination is done based upon each potential counterparty's bid price (PRICE(SID)), being converted to the consideration/entitlement type, currency, and national currency consideration "payment" denominations sought by the ordering party (that is, PRICE(SID)=PRICE(SID) * C-C/EDXCHANG(SID) * C-CXCHANG(SID) * C-NCXCHANG(SID)). The counterparty identification is stored in SID, and its price offer is stored in BPRICE. At block 1580, the following check is made:

BPRICE>MAXCONSID

If the selected price is greater than the ordering party's specified maximum consideration payment (MAXCONSID) limit, a match with the current potential counterparty is not deemed possible. This must also be true for any of the remaining counterparties in the counterparty short list. This part of the matching process returns without any potential counterparty in the short list having been selected for a match (block 1612). Otherwise, the current price is acceptable, and the process proceeds to attempt a match with the current selected counterparty.

The next step (block 1590), requires all the applicable contract, product, and portfolio absolute loss, expected loss, expected value limits, and maximum composition limits to be read from the PSEL LIMIT master file (block 1600) and stored in ALL1(SID), ALL2(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), EVL1(SID), MC(SID) and MCC(SID). The current absolute and expected losses accumulated are also read and stored in CAL2(SID), CEL2(SID), CEL3(SID), CEL4(SID), and CEL5(SID). The ELFUNC(SID) and EVFUNC(SID) values are also set for use when calculating the expected loss and expected value for the current order. Block 1602 calculates the price of the order entitlement function using the counterparty product expected loss and expected value parameters ELFUNC(SID) and EVFUNC(SID). The order's expected loss is stored in EL(SID); the order's expected value is stored in EV(SID). The absolute loss function is also determined at block 1602 and it is stored in AL(SID). Proceeding to block 1604, the portion of the order which will not violate the counterparty limits is calculated. This check is made at test 1606. If no part of the order is matched, process flow continues at block 1608. The potential counterparty is removed from the counterparty shortlist.

If some portion of the order is matched with the current counterparty, processing continues at block 1610. Here the SID is set to the identification of the matching counterparty. The unmatched portion (if any) is stored at block 1614 as a new order in the PORD QUEUE masterfile (block 1616). Flow then returns to test 1261 in FIG. 11. When a match occurs, program flow returns to block 650. The matched order must now be confirmed by carrying out a number of additional steps, as shown in FIG. 16, blocks 1620 to 1641. If no match occurred, processing of the current order steps, and program flow returns to the beginning via connector "A". The system is ready to load the next available order.

Matched Order Confirmation

For matched orders to become a contract, a number of additional actions are required. First, at test 1620, a check for manual authorisation is made. If required, program flow moves to block 1621 where authorisation requests are sent to the relevant stakeholders. Block 1623 then tests the replies for any rejections. If one or more rejections were received, program flow continues at block 1627 where the order is rejected. Otherwise, flow continues at 1624. Block 1624 effects the consideration payment by creating transactions in the payment shadow file (PAYACC SHADOW—block 1625). However, this may fail if the accounts specified do not exist or if at least the required consideration amount is shown not to be available. Test 1626 checks that "consideration payment" was effected successfully. If "consideration payment" fails, the matched order is rejected (block 1627), with details stored in the rejected order master file, PORD REJ (block 1628). The ordering party is then informed of this event at block 1640.

With successful payment, program flow proceeds to block 1630 where the counterparty's current accumulated absolute and expected loss figures are updated (masterfile PSEL LIMIT—block 1631). At block 1632, the order data field OPRICE is set to the price given by the counterparty PRICE(SID), and SPRICE set to the counterparty's identification, SID. At block 1634, the matched order is certified as confirmed, with full details recorded in the masterfile PORD CONF (block 1636). The next step, block 1638, reports details of the newly created contingent contract to all stakeholders concerned. Program flow then returns to the beginning, via connector "A". The system is now ready to start processing the next order submitted by a specified ordering party.

6. Life Cycle of Risk Management Contract: Example III

The third example of a risk management contract describes a contract to manage risk associated with potential future movements in the value of a specified index of share prices (termed the PTSE 75 index). In summary, the example shows how the system could enable one party (such as an institutional fund manager) seeking to avoid the adverse consequences of a significant decline in the future value of the PTSE 75 index (specifically a decline by June 1994, relative to the assumed current (January 1993) value of the Index) to make a contract with another, as-yet-unknown, party, such as another fund manager seeking to avoid the adverse consequences of a significant corresponding increase in PTSE 75 Index value.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to a compensatory Australian dollar future payout upon payment of a calculated up-front consideration money amount by the ordering party to the as-yet-unknown counterparty. The future money entitlement is contingent on the value, at contract maturity date, of the independently-determined value of the PTSE 75 index.

In this example, the relevant key stakeholders are: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself); various product ordering parties (the relevant ones for the example being Abbotts & Taylor and Shearer & Associates); various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc); a counterparty guarantor (CNZ Banking Corporation); and an application regulator (the Pacific Central Bank).

The timeline depicting the steps in the contract from the first stop (Application Specification) to the final step (Contract Settlement) is shown in FIG. 17. FIGS. 58 to 70 are thirteen detailed explanatory charts supporting FIG. 17. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIG. 58, it can be seen that BLC Inc established a Contract APP (Application ID 001) on 91.06.03.17.00.00 (that is, 5 pm on Jun. 3, 1991) to deal with economic risk management. Application ID 001 supports a range of products (Applicable Product ID's 10020–11400).

Looking at the second step in the timeline (Product Specification) in conjunction with FIG. 59, it can be seen that BLC Inc was also Product Sponsor of Product 10061 at the same time (91.06.03.17.00.00). This Product relates to the Market termed Stock Indices and to the Sub-market termed PTSE 75. The maturity date for Product 10061 is 94.06.03.17.00.00.00. The consideration for a specific contract involving Product 10061 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is also in the form of commercial bank deposits denominated in Australian dollars, payable (if necessary) immediately after the Product's specified maturity date/time.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two entities, Abrahamsons and Carpenters Inc, acting as potential counterparties for forthcoming primary product orders dealing with Product 10061. At this point in the timeline (93.01.01.17.00.00,00), 19 months after the specification of Product 10061, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth stop in the timeline (Primary Order Specification), in conjunction with FIG. 60, it can be seen that an Ordering Party, Abbotts & Taylor, is seeking a contract, from an offering party, in Product 10061 at that time (93.01.01.17.37.06.00). FIG. 60 shows the specific parameters (entitlement) that Abbotts & Taylor has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 54,000 (denominated in commercial bank, Australian dollars).

In order to provide a more detailed explanation of the following fifth to seventh steps in the timeline, selected processing block numbers from FIGS. 8–16 will be referred to in brackets as follows:

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIG. 61, it can be seen that Abrahamsons' specified pricing parameters, as set at 93.01.01.17.37.05.00 are used to price the Abbotts & Taylor order at 93.01.01.17.38.02.00. Abrahamsons' pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 26 [1240].As is shown, this ID in turn implies a Commission Rate of 1.25%, a Discount Rate of 10.00% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example I, this results in a Contract Bid Price of 51,920 (denominated in commercial bank, Australian dollars), which Abrahamsons' parameters calculate will yield them a base margin on the contract of 4,580 (again denominated in commercial bank, Australian dollars) [1250].

Still, looking at the fifth stop In the timeline, in conjunction with FIG. 62, it can be seen that Carpenters Inc specified pricing parameters, as set at 93.01.01.17.37.06.00, are also used to price the Abbotts & Taylor order at 93.01,01.17.38.02.00. Carpenters Inc's pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 17 [1240].As is shown, this ID in turn implies a Commission Rate of 1.30%, a Discount Rate of 9.80% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results In a Contract Bid Price of 53,050 (denominated in commercial bank, Australian dollars), which Carpenters Inc's parameters calculate will yield them a base margin on the contract of 5,610 (again denominated in commercial bank, Australian dollars) [1250].

Again, still looking at the fifth step in the timeline, in conjunction with FIG. 63, it can be seen that Abrahamsons' pricing-related parameters (also set at 93.01.01.17.37.05.00) for determining the acceptability of ordered-contracts on the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are satisfied by Abbotts & Taylor's order [1604].From Abrahamsons' perspective, this qualifies Abbotts & Taylor's order for Inclusion in their product/contract portfolio, as long as Abrahamsons' consideration price bid turns out to be lower than Carpenters Inc's price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, In Its order specification (FIG. 60), it is prepared to pay.

Finally, still looking at the fifth step in the timeline, but now in conjunction with FIG. 64, it can be seen that Carpenters Inc's pricing-related parameters (set at 93.01.01.17.37.06.00) for determining the acceptability of ordered-contract on the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are also satisfied by Abbotts & Taylor's order. Now, from Carpenters Inc's perspective, this qualifies Abbotts & Taylor's order for inclusion in their product/contract portfolio, in this case, as long as Carpenters Inc's consideration price bid turns out to be lower than Abrahamsons' price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, in Its order specification (Page G4), it is prepared to pay.

Looking at the sixth step in the timeline (Order Matching), it can be found that Abrahamsons' price bid of 51,920 is below Carpenters Inc's bid of 53,050 and, in turn, that the 51,920 amount is below Abbotts & Taylor's specified maximum consideration price of 54,000. This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons' at 93.01.01.17.38.07.00 [1260].

The seventh step in the timeline (Order/Contract Confirmation) takes place five seconds later at 93.01.01.17.38.11.00, after the system has determined that Abbotts & Taylor is able to (and then does) Immediately pay the required consideration funds amount of 51,920 to Abrahamsons [650].

Looking at the eighth stop in the timeline (Contract Valuation) in conjunction with FIG. 65, one can see a contract valuation report for Abbotts & Taylor published nearly six hours after confirmation of the contract, that is, at 93.01.01.23.00.00.00. As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1970 (with a standard deviation of 333), which implies that this contract has an expected future value of 53,000 commercial bank-denominated Australian dollars (with a standard deviation of 21,160). On FIG. 66 one can see in the equivalent report for Abrahamsons that their required expected future entitlement payout is identical to Abbotts & Taylor's expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Secondary Order Specification), detailed on FIG. 67, occurs nearly six months after the above-described contract valuation event; that is, at 93.06.06.08.00.00.00. At this time, Abbotts & Taylor is seeking to sell its position in the contract which was matched/confirmed at 93.01.01.17.38.11.00 (and at that time assigned the

Order ID of 9156515800 by the system) at a price better than 57,000. Shearer & Associates is prepared to pay 60,000 (commercial bank deposit-denominated Australian dollars) for this position. In all other respects the contract's attributes remain unchanged. On FIG. 68, the tenth step in the timeline, a contract sale is seen to have occurred at a price of 58,300, just below the above-described 60,000 upper limit purchase-price amount specified by Shearer & Associates. This amount is the current best estimate of the contract's expected future value, with the standard deviation of this expected future value calculated by the system, utilizing other recent transaction data, as being 10,610. Shearer & Associates has now formally taken the place of Abbotts & Taylor as a stakeholder to the contract.

The eleventh step in the timeline (Contract Valuation) refers to a contract valuation report published for Shearer & Associates seven months later, at 94.01.01.17.00.00.00 (see FIG. 69). As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1800 (with a standard deviation of 283), which implies that this contract now has an expected future value of 162,360 commercial bank deposit-denominated Australian dollars (with a standard deviation of 35,160). This is an increase in expected future value of 104,060 for Shearer & Associates since the former valuation date/time. The above-described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The twelfth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 94.06.03.17,00,00,00. As can be seen on FIG. 70, this product value of the PTSE Index was specified by BLC Inc (as Product Sponsor) to be 1820, implying a contract value of 187,200 (commercial bank deposit-denominated Australian dollars) to Shearer & Associates, and a corresponding obligation on Abrahamsons. The figure of 1820 represents the actual value of the PTSE share price index at 94.06.03.17.00.00.00 as obtained by BLC Inc from the independently verifiable information source, the identity of which they would have disclosed at the time they first announced their sponsorship of trading in the PTSE 75 share Index product.

The thirteenth step in the timeline involves the formal payment of 187,200 (commercial bank deposit-denominated Australian dollars) by Abrahamsons to Shearer & Associates (ignoring possible fee payments by one or both parties).

7. Description of Consideration/Entitlement Payment Process

The purpose of the CONTRACT APP consideration/entitlement (and related transactions) payment/receipt process is to effect debits and credits to INVENTCO stakeholder accounts, typically at maturity of a contract, with participating consideration/entitlement transfer (or exchange) entities, reflecting payment/receipt entitlements and obligations originated within INVENTCO. The process effects these payments/receipts in a two-stage process. First, by debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts-with a participating consideration/entitlement transfer entity (C/E entity), external to INVENTCO, with which they maintain an account. And second, by periodically effecting, via existing and potential payment mechanisms, corresponding payment instructions to the payment entities concerned. Details of the above-described mechanism are as follows.

All INVENTCO stakeholders maintain (a minimum of) two special-purpose (net-credit balance only) accounts with (at least) one selected, VIRPRO authorised, C/E transfer entity. The purpose of special-purpose accounts is to ensure that only INVENTCO-initiated debits and credits are capable of being effected to the accounts. Thus, at any time the balance of each PAYACC SHADOW file account record should, be equivalent to the true, but usually unknown, time-of-day balance of the actual account maintained by the C/E transfer entity.

The purpose of two accounts is to enable only credits to be effected through one account and only debits through another account. And the purpose of "net-credit balance only" accounts is to ensure that accumulated debits to the debits-only account never exceed the account opening balance plus accumulated credits to the credits-only account. C/E transfer entities will typically be (but do not need to be) institutions of any/all of six types: public/private record-registries of various types; credit card companies (typically for retail transactions only); commercial banks; central banks; taxation authorities; and non-bank clearing houses and depositories.

The resources transferred by these entities may be of any type. However, most typically, they will be deposits appropriate for the entity concerned: With respect to public/private record-registries—entitlement deposits (including shares in financial or physical assets, participation rights in wagers, and so on). With respect to credit/debit card companies—normal card company deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to commercial banks—normal bank deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to central banks—exchange settlement account (or equivalent) deposits. With respect to taxation authorities—taxation account deposits. And with respect to non-bank clearing houses and depositories—deposits of financial instruments, precious metals and the like. CONTRACT APP potential counterparties will also effectively be C/E transfer entities, as will ordering party guarantors (external to INVENTCO) where they offer credit to product ordering parties. Also, some accounts will be trust accounts maintained on behalf of potential counterparties (and some product ordering parties) involved in applications requiring the periodic payment of collateral to independent third parties to serve as an additional security device.

Immediately after the completion of its daily—or more frequent—transaction processing, and their associated settlement functions, each C/E transfer entity electronically notifies the applicable CONTRACT APP of the "opening balances" of all the debit and credit INVENTCO accounts it maintains (At this stage, the debit account balance should be zero and the credit account balance should be greater than or equal to zero). Where an INVENTCO stakeholder has an overdraft or line-of-credit with its C/E transfer entity, the credit value of this will be reflected in the non-zero balance of its credit account at this time.

Upon receipt of the above-described notifications, the applicable CONTRACT APP updates/confirms its stakeholder shadow balances. Thus, at this point-in-time, all credit and debit shadow account balances should be equivalent to their actual debit and credit account balances.

Progressively throughout the day (where "day" here is likely to be different for each C/E transfer entity due to a combination of differences in the time-zone locations of payment entities in relation to the applicable CONTRACT APP, and the likely different account processing cycles of these entities), INVENTCO-stakeholder—authorised debits and credits to INVENTCO stakeholder shadow accounts are effected on a real-time basis—debits to debit accounts and credits to credit accounts. At all times, the CONTRACT APP ensures that the cumulative debit balance of each stakeholder's debits account does not exceed the "opening balance" plus the cumulative credit balance of the stakeholder's credit account. Thus, at any time, for every INVENTCO stakeholder, the combination of each stakeholder's debit account and credit account will represent the "true", net, time-of-day value of the stakeholder's two actual special-purpose accounts maintained external to INVENTCO.

Debits and credits to INVENTCO stakeholder accounts are effected according to strict rules and conditions, being different for credits and debits. Credits can be made to any INVENTCO stakeholder's credit account with its nominated C/E transfer entity by any other INVENTCO stakeholder for any reason. Naturally, as INVENTCO stakeholders will not know the account details of other stakeholders, such credits will be effected either automatically, according to information and rules known by the applicable CONTRACT APP, or semi-automatically by way of an INVENTCO stakeholder requesting from VIRPRO, as they need to do so, a credit-account number of the stakeholder to which they wish to transfer assets. This account number may only be valid for a nominated period and would not typically be the specified stakeholder's actual account number with its nominated consideration/entitlement transfer entity—it would only be a reference to an INVENTCO file containing this number.

On the other hand, debits can only be made to an INVENTCO stakeholder's debit account with its nominated C/E transfer entity by the stakeholder itself, and by other stakeholders explicitly granted this right by each stakeholder, subject to these other stakeholders exercising this right according to the rules and conditions specified for them.

Where an INVENTCO stakeholder seeks to initiate/authorise debits to its nominated account(s) on its own, this can only be done through the stakeholder satisfactorily completing the identification and security procedures set down by their C/E consideration/entitlement transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). The type of procedure set down by all participating C/E transfer entities involves (at least) the following: First, the consideration/entitlement transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts, and a similarly confidential "black box" which, by initiating any of a number of possible proprietary password request-response processes involving any one of its customers possessing the appropriate device(s), confirms that remote messages received from that customer, and processed by the "black box", are authentic. Second, the consideration/entitlement transfer entity supplying their INVENTCO customers with a programmable smart card (or equivalent device) enabling each customer, remotely—via telephone or direct computer line, to unambiguously confirm their identity with their INVENTCO-maintained account, thereby having the capability to authorise debits to their account within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on. Third, INVENTCO providing the mechanisms for direct, confidential, stakeholder communications with their C/E transfer entity shadow debit accounts, and the formal updating of these accounts, through non real-time processes, utilizing the unique time-stamped reference numbers created as/when stakeholders authorise access to their account records.

Where an INVENTCO stakeholder has authorised other INVENTCO stakeholders to initiate debits to (any of) its nominated account(s) according to a standing authority of some type, this can only be done through the authorised stakeholder itself satisfactorily completing the identification and security procedures set down by the authorisation-granting stakeholder's nominated C/E transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). Once again, the type of procedure, set down by all participating C/E transfer entities in this respect, involves (at least) the following: First, the C/E transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts and each other INVENTCO stakeholder which has been authorised to effect debits (within defined parameters) to these accounts. Second, the C/E transfer entity supplying VIRPRO with a similarly confidential black box which, by initiating any of a number of possible proprietary password request-response processes involving an entity nominated by any of its customers possessing the appropriate device(s), confirms that remote messages received from that authorised entity, and processed by the black box, are authentic. Third, the C/E transfer entity supplying their INVENTCO customers with a collection of programmable smart cards (or equivalent devices), for distribution to these authorised entities, enabling each authorised entity, remotely—via telephone or direct computer line—to unambiguously confirm their identity with the customer's PAYACC SHADOW account, thereby having the capability to authorise debits to this account (again, within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on). And four, INVENTCO providing the mechanisms for direct, confidential, authorised stakeholder communications with a stakeholder's C/E transfer entity shadow debit account(s).

At the end of each C/E transfer entity's specified day (or part of a day), the applicable CONTRACT APP transfers (at least) two things to the entity: First, if required, a series of figures representing the exchange settlement (or equivalent) accounting entries it has or will communicate to the C/E transfer entity's appropriate clearing authority (for each of the applicable consideration/entitlement denomination, currency and national currency types of the payments/receipts involved) where these figures represent the balancing net debit or credit figure corresponding to the aggregation of all of the entity's

INVENTCO customer transactions in the prior day. And second, a detailed file of all customer transactions effected during the day (corresponding, if required, to the above-described net figures). Upon their receipt of these transactions and summary figures, the C/E transfer entity then debits/credits each transaction to the appropriate actual customer accounts, enabling new "closing" account balances to be calculated (these "closing" balances should be exactly the same as the end-of-day balances commumicated by the applicable CONTRACT APPS with it's file of customer transactions). In turn, these "closing balances" become the C/E transfer entity's account "opening balances" for the next day. The CONTRACT APPS notification process then repeats itself.

Where applicable, at days-end for the "clearing house" of clusters of like C/E transfer entities (for example, a national central bank), CONTRACT APP transfers netted exchange settlement accounting entries to the clearing houses concerned. These entries serve to "balance the individual customer account entries transferred to each associated C/E transfer entity individually.

8. Industrial Applicability

The invention has industrial application in the use of electrical computing devices and data communications. The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices. The types of events associated with the risk management apparatus and methodologies includes physical and technical phenomena, and therefore have value in the field of economic endeavour.

GLOSSARY OF KEY TERMS

A.

Alpha (X)

The Ordering party-specified event value corresponding to the Xth future product event value contract entitlement payoff (payout) inflection point.

Application Promoter

An entity authorised by VIRPRO that specifies and administers defined rules and regulations underlying a defined CONTRACT APP—including the specific products offered for trading; categories of, and conditions of involvement, of stakeholders; nature of involvement and dispute resolution procedures of stakeholders. Automatic/manual deal and no deal flags

Indicators notified by each stakeholder to CONTRACT APP specifying the manner in which that stakeholder wishes to deal with each other stakeholder.

AXSCO

A communications co-ordination and security system, linked to all stakeholders and component applications.

B.

Base Pricing probabilities

The prices set by sellers for unit entitlement payoffs of a contract at each of its possible future index values denominated in the contract's formally specified consideration/entitlement, currency and national currency.

Beta (X)

The Ordering party-specified desired entitlement payoff (payout) amount in the desired currency denomination of contract entitlement payout (payoff) and national currency denomination of contract entitlement payout (payoff) corresponding to the Xth event value inflection point. Bilateral Obligations Netting indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all pairs of participating stakeholders are to be netted. Bilateral Payments Netting indicator

An indicator that individual end-of-day gross payments/receipts to/from all pairs of participating INVENTCO stakeholders are to be netted.

C.

Commission rate

The minimum required percentage profit margin required by a Potential Counterparty above the "breakeven" bid price for an Ordering party purchase order. Consideration/Entitlement Transfer Entity

An entity acceptable to VIRPRO and the Application Promoter, satisfying defined minimum standards of financial strength, credit standing and integrity, able to maintain Consideration/entitlement accounts on behalf of stakeholders and effect transfers of those assets as directed.

CONTRACT APP stakeholder types

Expected stakeholder types are Application Promoter, Product Sponsor, Product Ordering party, Counterparty, Counterparty-Guarantor, Regulator, Consideration/entitlement Transfer Entities and Miscellaneous other parties.

Contract and Product "absolute loss" limit

A value limit specified by a potential counterparty of the maximum absolute loss it is prepared to sustain on a contract/product irrespective of the assessment of the likelihood of any particular level of possible loss being incurred.

Contract and Product "expected loss" limit

A value limit specified by a potential counterparty of the maximum expected loss it is prepared to sustain on a contract/product based on the counterparty's assessment of the likelihood of all levels of possible loss being incurred.

Contract Authorisation

A process of verifying that an Ordering Party product purchase order contains data appropriate to the product being sought and that the Ordering Party is accurately identified and credentialled.

Contract Collateralisation indicator

A descriptor set by the Application Promoter specifying whether and on what basis, counterparties may be required to periodically transfer assets/monies (collateral) to an independent trust fund to ensure they will be able to meet their potential entitlement payoff obligations on the maturity date of a contract.

Contract Confirmation

The process of securing the positive agreement of all affected stakeholders to a purchase order, including acknowledgement by the relevant Consideration/ entitlement transfer entity of the Ordering party's ability to pay the required product consideration and fees, either automatically or through manual approvals.

Contract Matching

See Ordering party/Potential counterparty matching process.

Contractual Obligation

a. A binding commitment one entity (or group of entities) has to provide products or services or information to another entity (or group of entities) in exchange for an agreed quantity of other products, services or information.

b. A binding commitment all entities have to the network and general management system entity VIRPRO and thus to each other, to accept constraints on their activities imposed by other authorised entities on terms specified and agreed to by them as a condition of their participation in one or more of the component systems.

Contract Portfolio Netting

A term used to describe the process of "setting-off" or "netting", the future payment entitlement obligations between Ordering parties and Counterparties, either bi-laterally or multi-laterally. Currency and National Currency exchange rates

The rates used to convert contract consideration/entitlement currency and national currency requirements into the product's consideration/entitlement currency and national currency denomination.

D.

Deal flag

An indicator or "flag" notified to CONTRACT APP signifying that the stakeholder is satisfied to deal unreservedly with the stakeholder against whom the flag has been set.

Defined Circumstances

The possible combinations of the categories of product-order information provided by Ordering parties.

Defined Probability Distributions

A set of pricing probability parameters specified by an Ordering party and including at least, a probability distribution type identifier, the expected value of the distribution, the standard deviation of the distribution and a probability distribution adjustment value or function.

Desired Currency Denomination of Contract Entitlement

A term indicating the currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired Currency Denomination of Consideration Payment

A term indicating the currency in which an Ordering party wishes to pay the required consideration for the contract sought.

Desired National currency Denomination of Contract Entitlement

A term indicating the National currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired National currency Denomination of Consideration Payment

A term indicating the National currency in which the Ordering party wishes to pay the required consideration for the contract being sought.

Discount rate

The rate used to determine the present value of a potential counterparty's expected future entitlements.

E.

Entitlement

The payout expected by the offering party at maturity as specified for each outcome in the range of outcomes. The payout can be both positive and negative in value over the range of outcomes, and can be in the form of money or other non-money types of goods, services, promises, credits or warrants.

EV-CE pricing

A price discovery mechanism for primary contracts meaning "expected value certainty equivalent pricing" being the calculated expected present value or future value of the contract.

Expected Value

A function in EV-CE pricing which means the sum of the products of all possible contract entitlement payoff/payout amounts and the Ordering party's/ Counterparty's assessment of the probability of occurrence of the future events which would contractually give rise to these entitlement payoff amounts.

Expected value limits on a Counterparty's aggregate product portfolio

Optional value limits specified by a Potential counterparty at any one time, where time can be specified in terms including "equivalent maturity date"; "same-month maturity date" and "all possible maturity dates" including product expected loss limits and maximum (and possibly minimum) proportion of the expected total loss of the aggregate of the Counterparty's product portfolio that can be accounted for by the expected loss on the individual contract/product.

G.

Gamma(X)

The Ordering party-specified desired shape of the function between each of the co-ordinates Alpha(1), Beta(1) and Alpha(2), Beta(2) and so on; such that Gamma can represent all possible mathematically definable shapes.

I.

I-INVENTCO

The Infrastructure component of INVENTCO.

INVENTCO

A collection of one or more (potentially interrelated) systems, where each system is the combination of a telecommunications, computing and other forms of infrastructure, and a variety of markets and support services distributed by this infrastructure.

M.

M-INVENTCO

A depository of VIRPRO authorised "markets" application software.

Manual deal flag

An indicator or "flag" notified to CONTRACT APP by a stakeholder signifying that the stakeholder wishes to manually approve a transaction involving the other stakeholder against whom the flag has been set.

Multilateral Payments Netting indicator

An indicator that individual end-of-day gross payments/receipts to/from all participating stakeholders from/to a specified third party trustee/clearing entity are to be netted.

Multilateral Obligations Netting indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all participating stakeholders from/to a third party trustee/clearing entity are to be netted.

N.

Negative Contract Payoffs

A type of contract in which the contract Ordering party may have a contingent payoff to the contract's Potential counterparty (i.e. the reverse of a normal contract).

No Deal flag

An indicator or "flag" notified to a CONTRACT APP by a stakeholder signifying that the stakeholder does not wish to deal in any way with the other stakeholder against whom the flag has been set.

O.

Ordering party Contingent Claims Function

Specifications of a product payoff or a mathematical function to calculate an Ordering party's product payoff requirement.

P.

Portfolio Product "expected loss" limit

A value limit, specified by a potential Counterparty, of the maximum expected loss the potential Counterparty is prepared to sustain on its product portfolio based on the Counterparty's assessment of the likelihood of all levels of possible loss being incurred.

Product Ordering party

An entity acceptable to VIRPRO and the Application Promoter, interested in and able to acquire a CONTRACT APP product.

Product Establishment date/time

The date/time an Application Promoter first offers a defined product for trading.

Product future event value "density" indicator

An indicator specifying the number of intermediate points between the minimum and maximum future event product definition values specified for the product by the Application Promoter/Product Sponsor.

Product event value "width" indicator

An indicator specifying the range (minimum-maximum) of future event values accommodated by the product as set by the Application Promoter/Product Sponsor.

Product future event value

A term used to indicate the actual value of a defined product at its date/time of maturity.

Product Maturity date/time

The date-time at which the Application Promoter is required to make a determination of the actual event value to enable entitlement and related payoffs on successful contracts.

Product Price Quote requests

A type of product purchase order for which the matching process is terminated and the result communicated to the Ordering party, when a desired price bid or range of price bids has been obtained.

Product Purchase Orders

Specific product purchase orders for which the Ordering party is seeking a potential Counterparty match, which may be of three types: automatic orders; manual orders and "hide" orders.

Product Purchase Order withdrawals

Ordering party-initiated requests to withdraw from processing pre-submitted but as yet unconfirmed product purchase orders.

Product potential Counterparty

An entity acceptable to VIRPRO and the Application Promoter, exceeding a defined minimum standard of financial strength, credit standing and integrity, offering defined CONTRACT APP products to product Ordering parties.

Product Sponsor

An entity acceptable to VIRPRO and the Application Promoter, having responsibility for detailed definition of product parameters including the continual determination of product values over time.

R.

Regulator

An entity acceptable to VIRPRO having local, state, national or international jurisdiction over one or more CONTRACT APPS.

S.

Set of Pricing Probabilities

The range of probabilities a potential Counterparty applies to a class of Ordering party order, specified by the value of "defined circumstances" and applying to every feasible future product event defined for that product by an Application Promoter.

Stakeholder

An entity that is a registered participant in one or more of INVENTCO's component parts.

V.

Value Dates

The respective dates/times at which matched contract consideration and entitlements are agreed to be made by the relevant Ordering party/Counterparty to a contract.

VIRPRO

The network and general management system component of INVENTCO.

X.

"X"

A term indicating the number of contract payoff (payout) inflection points the Ordering party is seeking within the allowable range of future product event values (including the value range extremity points).

CONTRACT APPS

Overview

CONTRACT APPS is a term used to refer to certain types of units of applications software which can, but do not need to, reside within an INVENTCO system's (M-INVENTCO) depository of "markets" software. The purpose of individual CONTRACT APPS is two-fold: First, to effect the trading/exchange/transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trades/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through to their time of maturity, including their ultimate settlement.

Individual CONTRACT APPS perform theses tasks according to the specific rules they embody, defined by their own stakeholders. CONTRACT APPS effectively reside upon AXSCO and within M-INVENTCO.

Stakeholder Types

CONTRACT APPS accommodate eight (and potentially fewer) generic types of their "own" stakeholders (as distinct from other INVENTCO stakeholders) termed: application promoter, product sponsors, product ordering parties, potential product counterparties, counterparty-guarantors, regulators, consideration/entitlement transfer entities, and other miscellaneous parties.

Some details of these stakeholders are as as follows: an application promoter is an entity having overall responsibility for the functioning of a CONTRACT APP (that responsibility having been granted by VIRPRO); a product sponsor is an entity which promotes and administers the rules of trading, and subsequent management, of defined contingent claims contracting product(s) selected for inclusion in a CONTRACT APP by its application promoter; a product ordering party is an entity seeking to acquire a CONTRACT APP product from a potential product counterparty (where a product ordering party can also be a product counterparty); a potential product counterparty is an entity potentially prepared to satisfy the CONTRACT APP product needs of a product ordering party (where a potential product counterparty can also be a product ordering party); a counterparty-guarantor is an entity guaranteeing a product counterparty's ability to settle any/all of its potential entitlement transfer obligations to a product ordering party to which it has become a counterparty as a result of a CONTRACT APP effected "match"; regulators are entities overseeing the on-going performance of all other stakeholders involved in a CONTRACT APP, especially counterparty-guarantors; consideration/entitlement transfer entities are entities with which all other CONTRACT APP stakeholders maintain "accounts" to transfer required considerations/entitlements to/from all each other; and miscellaneous parties are all other entities having a defined stake in the functioning of a CONTRACT APP.

Miscellaneous parties include: independent entities contracted by application promoters or product sponsors to formally determine the "value" of products on their date-of-maturity; multilateral obligations and payment netting trustee/clearing entity organisations; independent (non-regulator) taxation and other governmental authorities; electronic "gateway" providers (external to INVENTCO); and host system organizations (in the case of CONTRACT APPS within INVENTCO systems linked to a common host system). CONTRACT APPS accommodate any number of their own stakeholders of each of the above-defined generic types.

Product Types

CONTRACT APPS can support risk aversion contract "product types" with any combination of values of multiple attributes, including: the fundamental nature/purpose of the product; the establishment/maturity date/time of the product; the consideration/entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/entitlement identifiers associated with the product; the "width" and "density" identifiers of possible future event values of the product; and miscellaneous other product descriptors.

The "fundamental nature/purpose of the product" attribute may incorporate identifiers including: a conditional entitlement-payoff dimensions identifier; a market identifier; a sub-market identifier; and a market-type identifier. The "conditional entitlement-payoff dimensions identifier" specifies the number of dimensions to an ordering party's sought-after conditional entitlement-payoffs. The market identifier specifies whether the product relates to an "actual" or "perceived" phenomenon (or phenomena), the number of such phenomena (if applicable), and the applicable phenomenon category (for example, industrial, scientific, financial market hedging, and so on). The sub-market identifier provides a more specific description of the product concerned. The market-type identifier specifies the applicable future period date/time (where this can be anything—for example, "at a defined contract maturity date/time", "at a specified time on or before contract maturity date/time", and so on), and type-of-future event involved (where, again, this can be anything—for example, as an indicator of some relative value of a phenomenon (spot value, average value and so on), or as an indicator of the "rate-of-change" of some value of a phenomenon.

The "establishment and maturity date/time of the product" attribute specifies, respectively, the date/time an application promoter first offered a product for trading, and the date/time at which the defined product matures (that is, the date/time at which the product sponsor is required to make a determination of the actual event value at that date/time so enabling contract entitlement transfers to be effected).

The "consideration/entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/entitlement identifiers associated with the product" attribute specify: the type of consideration/entitlement involved (where this can include rights and entitlements, physical assets, and "money" of all possible types); in the case of a "money" consideration/entitlement type, the currency of the consideration/entitlement (where such currency types can include: public/private record-depository deposits, commercial credit card company deposits, commercial bank deposits, central bank deposits, taxation authority deposits, and deposits in non-bank clearing houses and depositories, and the like); and, again, in the case of a "money" consideration/entitlement type, the national currency of the consideration/entitlement identifier (where such national currency types can be in any national currency, or form of synthetic currency).

The "width and density identifiers of possible future event values of the product" attribute specifies, respectively: the minimum and maximum values of the allowable range of future event values accommodated by a product; and the number of intermediate points between the defined minimum and maximum future event values accommodated by the product.

The "miscellaneous other product descriptors" attribute specifies such things as: the degree of stakeholder access granted the product by the application promoter in question; the forms of trading-services granted the product by the application promoter in question (where this product attribute specifies the accessibility of the product to a range of feasible "stakeholder services" with respect to such things as contract portfolio netting, contract collateralisation, consideration credit provision, ordering party ability to specify negative contract entitlements, and availability of secondary/derivative market product trading); and the degrees of trading, clearing and settlement "transparency" granted the product by the application promoter in question.

Transaction Types

A range of primary, secondary, derivative-primary, and derivative-secondary risk aversion contract transactions are accommodated by CONTRACT APPS.

The-range of "primary" (and derivative-primary (options, for example)) risk aversion contract transaction-types (handled principally by Processes 2 and 4—include: ordering party product orders (and option orders) for which the ordering party is seeking a counterparty "match". ordering-party price quote (and options price quote) requests; and ordering-party withdrawals of existing product orders (and withdrawal of options on product orders). Ordering party product orders consist of: automatic orders and manual orders. Automatic orders consist of: normal-automatic orders (being orders the ordering party is prepared to have matched automatically, subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the ordering party is prepared to have matched automatically, subject to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the ordering party). Manual orders consist of normal-manual orders (being orders the ordering party wishes to manually authorise before they are finalised—that is, after a counterparty "match" has been effected but before the contract has been "confirmed"—subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-manual orders (being orders the ordering party wishes to manually authorise before they are finalised—that is, after a counterparty "match" has been effected but before the contract has been “confirmed”—subject to the constraints defined in the ordering party’s order, in addition to whatever “match” constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the ordering party).

The range of “secondary” (and derivative-secondary (options, for example) risk aversion contract transaction-types (handled principally by Processes 3 and 5— include: acquiring party product orders (and option orders) for which the acquiring party is seeking to “acquire” the position of a specified “risk counterparty” stakeholder in an existing contract; acquiring-party product price indications (and option price indications); and acquiring-party withdrawals of existing product orders (and option withdrawals).

Acquiring party product orders for which the acquiring party is seeking to “acquire” the position of a specified “risk counterparty” stakeholder in an existing contract, consist of automatic orders and manual orders.

Automatic orders consist of: normal-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject only to the constraints defined in the acquiring party’s order, in addition to whatever “match” constraints other CONTRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject to the constraints defined in the acquiring party’s order, in addition to whatever “match” constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the acquiring party).

Manual orders consist of normal-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised that is, after a "match" has been effected but before the contract "sale" is "confirmed"—subject only to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised—that is, after a "match" has been effected but before the contract "sale" is "confirmed"—subject to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the acquiring party).

Primary Product Pricing Process Types

CONTRACT APPS enable potential counterparties to automatically establish "bids" on any defined (primary and derivative-primary) product order according to either an "expected value/utility-certainty equivalent" (EV/U-CE) pricing regime, or any other mathematically-definable pricing regime.

In the case of an "expected value-certainty equivalent" (EV-CE) pricing regime, each potential counterparty specifies, amongst other things: an indicator of certain defined attributes of an as-yet-unknown product order; a base commission rate; a base discount rate; (if applicable) a set of base consideration/entitlement denomination, currency, and national currency exchange rates; base unit product prices; and desired adjustments to the preceding base-bid-price determinants dependent on any specific order (submitted by a specified ordering party).

The above-described indicator of certain defined attributes of an as-yet-unknown product order (termed, defined circumstances) may reflect any combination of the multiple characteristics of an order (irrespective of the ordering party concerned), including: the multiple attributes of the contingent claims function sought; the ordering party's interest or otherwise in being granted credit by a counterparty; the ordering party's interest or otherwise in participating in the possible netting and collateralisation features of the APP; and the maximum (and possibly minimum) consideration amount the ordering party is prepared to pay for their defined product. The above-described base commission rate specifies the minimum required percentage profit margin required by the counterparty above their breakeven consideration bid price for a product order.

The above-described base discount rate determines the present value of the counterparty's expected future entitlement associated with a contract (net of the ordering party's consideration, and making allowance for the future income stream this consideration is expected to generate). The above-described set of base consideration/entitlement denomination, currency and national currency exchange rates are used, where applicable, to convert an ordering party's contract requirements into the base consideration/entitlement denomination, currency and national currency of the product so enabling the contract matching process to make like comparisons of counterparty bids for product orders.

The above-described base unit product prices are prices set by potential counterparties for unit entitlement-payoffs of a contract at each of its possible future values, denominated in the contract's formally specified consideration/entitlement type and, if applicable, currency type and national currency type (where these unit prices can be specified as directly input figures for every feasible future product event (the sum of which may or may not add to 1), or as parameters of defined mathematical functions). The above-described desired adjustments to the preceding base-bid-price determinants dependent on the specific ordering party submitting a specific order can include: a commission rate adjustment; a discount rate adjustment; a consideration/denomination exchange rate adjustment; a currency exchange rate adjustment; and a national currency exchange rate adjustment.

In the case of an "expected utility-certainty equivalent" (EU-CE) pricing regime, each potential counterparty specifies all of the above-described parameters applicable to a EV-CE pricing regime as well as "utility bench-mark" figures for all possible consideration and entitlement "payment amounts" which could, conceivably, be associated with a product/contract.

Primary Product Matching Process Types

CONTRACT APPS may similarly accommodate any of a number of possible (primary and derivative-primary) order matching processes where these processes can be of multiple types, including sequential processes and simultaneous processes.

Sequential order matching processes can be characterised according to the "sequence determining" and "matching" rules they embody, where "sequence" rules may be of various types: "last-in-first-out (LIFO)", "first-in-first-out" (FIFO)", priced priority, and so on; and matching rules may also be of various types—for example, a specific matching process could seek, for each product ordering party, a counterparty (or counterparties) offering a product price at or below the maximum price the ordering party is prepared to pay (where the determined contract price could be either the lowest price offered by a potential counterparty, the mid-point between the an ordering party's specified "maximum consideration amount" and the lowest price offered by a potential counterparty, and so on); or seek for each potential product counterparty an ordering party prepared to pay the maximum price above a price at which the counterparty is prepared to deal (here, the determined contract price could be either: the ordering party's "maximum consideration amount" price, the mid point between the minimum price the counterparty is prepared to receive and the ordering party's "maximum consideration amount" price, and so on).

Simultaneous order matching processes are those seeking some type of optimum solution according to pre-defined objectives. For example: "maximise the number of ordering party-counterparty matches"; "maximize the aggregate consideration and/or entitlement value of ordering party-counterparty matches"; or "minimize the value of a function specifying the sum of the differences (possibly weighted according to their perceived importance) between the actual and desired values of match attributes of ordering parties and counterparties".

Both of the above-described sequential and simultaneous matching processes can also accommodate conditional contract matching rules; and pre and post tax price optimisation mechanisms.

Application Types

CONTRACT APPS may be: "in-house" APPS or "public" APPS; "single potential counterparty" APPS or "multiple potential counterparty" APPS; APPS with differing degrees and forms of "regulator" oversight of other application stakeholders; and APPS with differing degrees and forms of "counterparty-guarantor" oversight of product potential counterparties.

CONTRACT APPS support consideration "payment" value dates being "immediate" (meaning exactly the time at which a contract match is confirmed); or deferred until a defined time in the future, measured in terms of seconds, minutes, hours, or days. Similarly, CONTRACT APPS support entitlement "payment" value dates being "immediate" (meaning exactly the time at which the applicable application promoter formally notifies other CONTRACT APP stakeholders of the "result" of a maturing contract); or deferred until a defined time after the "result" of a maturing contract is known.

CONTRACT APPS allow contracts to be modified and liquidated after their creation. Contracts can be modified through: direct negotiation by the relevant "risk counterparties" to a particular contract; or the purchase/sale of "derivative" secondary risk aversion contract transactions (See Process 5 description below). Contracts can be similarly liquidated after their creation through sale of the contract (within or outside INVENTCO); and through direct negotiation between the initial ordering party and counterparties to the contract. They can also be effectively liquidated through the ordering party/counterparty acquiring a mirror image of the contract to which they are a party (within or outside of INVENTCO).

Post Order Process Types

CONTRACT APPS undertake various generic types of "post-order-process" management functions for all the above-described generic types of "transactions", including: a function which maintains a formal record of contractual commitments entered into by all CONTRACT APP stakeholders with one another, and with VIRPRO-authorised entities external to either the applicable CONTRACT APP or INVENTCO overall; a function which effects the independent valuation of consideration and entitlement obligations between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects "collateralisation" consideration/entitlement transfers between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP, based on above-described valuations of consideration and entitlement obligations associated with CONTRACT APP transactions; a function which determines and effects, as required, the bi-lateral netting of accumulated "consideration/entitlement" obligations "between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, the multi-lateral netting of accumulated "consideration/entitlement" obligations" between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nominated third-party "clearing house" entity); a function which manages the processing, accounting, reporting, and entitlement "payment" tasks associated with maturing contracts; a function which determines system usage and access fees payable to/from all CONTRACT APP (and other INVENTCO) stakeholders, and to/from VIRPRO-authorised entities external to INVENTCO; a function which determines and effects, as required, "bi-laterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders themselves, and from/to CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, "multi-laterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders themselves, and from/to CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nominated third-party "clearing house" entity); and a function which compiles and distributes CONTRACT APP (and other INVENTCO) stakeholder customised information.

Supplementary Process Types

CONTRACT APPS undertake various other types of support processes, including: enabling stakeholders to transfer consideration, entitlement and other "payment" obligations to and from one another, independently of transfers initiated by CONTRACT APP transactions (See Process 7 description below); providing CONTRACT APP (and other INVENTCO) stakeholders with shared access to specialist systems to assist them to decide how best to interface with the multiple aspects of INVENTCO (See Process 8 description below); and providing CONTRACT APP (and other INVENTCO) stakeholders with access to a range of INVENTCO-facilitated "value added services" (See Process 9 description below).

Matching Constraint Types

For their operation, CONTRACT APPS require all stakeholders to a specific APP to specify, amongst other things, which other stakeholders they do and do not want to have interactions with, and the conditions under which they wish to manually authorise some aspect of a transaction involving any other CONTRACT APP stakeholder over which they have control authority of some form.

In specifying which other stakeholders they do and do not want to have interactions with, CONTRACT APP stakeholders have various options. Application promoters can specify acceptable product sponsors, products, ordering parties and potential counterparties within their application—individually and by type. Similarly, product sponsors can specify acceptable application promoters, products, ordering parties, potential counterparties and counterparty-guarantors within their application—individually and by type.

Product counterparties and ordering parties (collectively) can specify: ordering parties/potential counterparties they do and do not want to deal with—individually and by type; the extent of their preparedness to be involved in contract netting and collateralisation arrangements provided for by their application promoter; application promoters, product sponsors, products, and consideration/entitlement transfer entities they do and do not want to deal with—individually and by type; ordering parties/ potential counterparties they prefer to deal with, and those with which they wish to deal exclusively; the degree of trading transparency they require; and their wish or otherwise to manually authorise order matches before they are confirmed.

Potential counterparties can specify which ordering parties, or classes of ordering parties, they are prepared to offer credit to (and under what terms), and ones they are prepared to allow "ordering party-guarantors" to offer credit to and under what terms. Similarly, product ordering parties (uniquely) can specify: counterparty-guarantors with which they do and do not want to deal (individually and by type); counterparties with which they wish to deal exclusively or preferentially to obtain a particular form of counterparty-credit; and potential "ordering party-guarantors" (external to INVENTCO) with which they do and do not want to deal.

Counterparty-guarantors can specify which potential counterparties have their authority to operate and which application promoters, product sponsors and ordering parties they are prepared, indirectly, to have relationships with. Similarly, regulators can specify which counterparty-guarantors, potential counterparties, ordering parties, application promoters, product sponsors and products have their authority to operate. Finally, consideration/ entitlement transfer entities can monitor and maintain up-to-date rules with respect to ordering parties, counterparties, application promoters, product sponsors, counterparty-guarantors, and regulators they are and are not prepared to deal with—individually and by type.

Ordering Party Requirements

For their operation, CONTRACT APPS require primary product ordering party stakeholders to a CONTRACT APP, in registering an order for a product of their choice, to specify: the above-described "product type" and "other stakeholder involvement" information; multiple attributes of the specific order they are seeking; their interest or otherwise in being granted credit by potential counterparties for their contract consideration amount, or in availing themselves of the possible netting and collateralisation features of the APP concerned; the maximum (and possibly minimum) consideration "price" they are prepared to pay for their defined product; and various other dimensions of their needs, where these include: the name/title by which they wish to be identified by other APP stakeholders; the time at which they wish their order to be submitted; the period of time after an order has been submitted that they wish the order to be retained before it is automatically withdrawn; whether or not they are prepared to accept partial matches of their order; the degree of market transparency they wish to be exposed to; whether or not they wish wish to have the option of trading a matched contract on an authorised INVENTCO secondary market (See Process 5 description below); whether or not they wish to manually consider/authorise potential counterparty quotes on an order; in the case where potential counterparty quotes are required to be manually considered/authorised, the maximum time after potential counterparty quote details are provided to the ordering party that the ordering party wishes to consider the quote(s); and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received.

The above-mentioned multiple attributes of a specific primary order an ordering party-is seeking include: their wish or otherwise to directly input the entitlement "coordinates" of their desired contingent claim order; their wish or otherwise to mathematically specify an entitlement function reflecting their desired product order, where such functions can be single or multidimensional (indicating a contingent contract entitlement conditional on two or more phenomena); the "consideration/entitlement unit", "currency" (if applicable), and "national currency" (if applicable) in which they wish to "pay"/"receive" their contract consideration/entitlement. Where an ordering party wishes to mathematically specify their desired primary product order as a single-dimensional entitlement function: the input term "X" can indicate the number of contract entitlement "inflection points" the ordering party is seeking within the allowable range of future product event values (including the value range extremity points); the input term "Alpha (X)" can indicate the ordering party-specified event value corresponding to the Xth future product event value contract entitlement inflection point; the input term "Beta (X)" can indicate the ordering party-specified desired entitlement amount (in the desired "consideration/entitlement form", "currency" and "national currency" entitlement denomination) corresponding to the Xth event value inflection point; and the input term "Gamma (X-1)" can indicate the ordering party-specified desired shape of the function between each of the co-ordinates: [Alpha (1), Beta (1)] and [Alpha (2), Beta (2)], [Alpha (2), Beta (2)] and [Alpha (3), Beta (3)], and so on (as applicable), where Gamma can represent all possible, mathematically definable, shapes.

Potential Counterparty Requirements

For their operation, CONTRACT APPS also require primary product "potential counterparty" stakeholders to a CONTRACT APP to define various parameters on the basis of which they can automatically price orders, including parameters with which they wish to establish a "consideration bid" on a defined product order; possible individual contract and product constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order; and possible expected-value product-portfolio constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order.

In defining parameters with which they wish to establish a "consideration bid" on a defined product order under a "EV-CE" pricing regime (described above), each potential counterparty is required to specify, amongst other things: an indicator of the appropriate "defined circumstances" of all possible product orders; a base "commission rate"; a base "discount rate"; (if applicable), a set of base "consideration/entitlement denomination", "currency" and "national currency" exchange rates; base "unit product prices"; and desired adjustments to the base commission rate, discount rate, exchange rates, and unit product prices on specific product orders according to the determined-value of the "defined circumstances" indicator (based on a specific product order).

Possible individual contract and product constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order, include: an absolute loss limit constraint (this constraint being specified as a single-figure constraint and/or as a function constraint);

an expected loss limit constraint (this constraint defining the maximum "expected" aggregate loss the potential counterparty is prepared to incur on a contract/product, taking into account their assessment of the likelihood of all feasible future product values occurring); and a constraint on the maximum proportion of the expected total loss of the aggregate of the potential counterparty's contracts/products that can be accounted for by the expected loss of the defined individual contract/product. Similarly, possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order include the maximum (and possibly minimum) proportion of the expected total loss of the aggregate of the potential counterparty's product portfolio that can be acccounted for by the expected loss of an individual contract/product.

Communications

CONTRACT APP stakeholders communicate with their applicable APP via AXSCO. Individual "stakeholder-to/from-AXSCO" communications can be by way of any/all of the following: voice communications with an AXSCO-linked "live operator" or "recorded messaging" system; touch-telephone communication with AXSCO directly; or computer-to-computer link with AXSCO (via a dedicated or dial-up communications line). With all three forms of communication, CONTRACT APP stakeholders may be required to utilize specified computer hardware and/or software mechanisms in their communications with AXSCO (including "payments" authorisation "black box" devices referred to below).

Component Processes

In their manifestation as telecommunications/computer software residing on telecommunications/computer hardware, individual CONTRACT APPS consist of a cluster of processes, utilizing a number of data files, residing on one or more processing units. A cluster of nine (and potentially more or fewer) specific processes and their related data files reside within a CONTRACT APP: a process handling file administration and updating tasks supporting all other processes (termed Process 1); a process handling the receipt and processing of "primary" risk management contract transactions (termed Process 2); a process handling the receipt and processing of "secondary" risk management contract transactions (termed Process 3); a process handling the receipt and processing of "derivative-primary" risk management contract transactions (termed Process 4); a process handling the receipt and processing of "derivative-secondary" risk management contract transactions (termed Process 5); a process handling the "back office" management of all four types of risk management contract transactions (termed Process 6); a process handling non-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7); a process handling CONTRACT APP (and other INVENTCO) stakeholder access to specialist systems to assist these stakeholders decide how best to interface with the multiple aspects of INVENTCO (termed Process 8); and a process handling CONTRACT APP (and other INVENTCO) stakeholder access to a range of INVENTCO-facilitated "value added services" (termed Process 9). These processes may function concurrently.

DESCRIPTION OF CONTRACT APP PROCESSES

Process 1

Process 1 handles file administration and updating tasks supporting all other processes (FIG. 18). The PRODUCT, PRODUCT TRANS, DEAL LIST and DEAL LIST TRANS files referred to in FIG. 18 are applicable, individually or collectively, to primary, secondary, derivative-primary, and derivative-secondary contract orders. The SEL PRICE, SEL PRICE TRANS, SEL LIMIT and SEL LIMIT TRANS files are applicable only to primary and derivative-primary contract orders. The TRADE PRICE, TRADE PRICE TRANS, TRADE LIMIT and TRADE LIMIT TRANS files are applicable only to secondary and derivative-secondary contract orders.

The file administration and updating tasks handled by Process 1 comprise: dealing with general data-file information received from CONTRACT APP stakeholders; dealing with general data-file and order processing information received from relevant other INVENTCO stakeholders, particularily VIRPRO and AXSCO; dealing with trading support information received directly from CONTRACT APP stakeholders; dealing with potential counterparty primary, and derivative primary, product order "consideration bid" parameters and order-match constraints; dealing with existing-contract offering party secondary, and derivative secondary, order match conditions; and dealing with miscellaneous information from entities external to INVENTCO.

Existing and prospective stakeholders are required to supply their applicable CONTRACT APP with specified identification and other information, and to continually maintain the integrity of this information. For each stakeholder, this information includes: applicable name(s), addresses, contact numbers, and references; their desired system access medium; their consideration/entitlement transfer entity account details; and, if applicable, their required schedule of fees and charges payable by other INVENTCO stakeholders. This information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

VIRPRO is required to supply the applicable CONTRACT APP with various forms of general data-file information Including: identification data relating to the application promoter for (each) CONTRACT APP; details of the permitted types of system access mediums; and consideration/entitlement denominations available in each application. Again, this information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN.TRANS.

VIRPRO is similarly required to supply the applicable CONTRACT APP with various forms of general data-file information including: information on all data received by and sent from the various parts of INVENTCO to one another and to entities external to INVENTCO; and statistical information of various types, including data traffic volumes, data file location information and so on. This information is continuously collected by AXSCO and maintained in the data file HISTORY.

Trading support information received directly from CONTRACT APP stakeholders comprises stakeholder relationship information of a general nature, and specific information from individual stakeholders.

Stakeholder relationship information of a general nature comprises "transaction communication parameters" and automatic/manual deal and no deal "flags". Transaction communication parameters are parameters set by all (registered) CONTRACT APP stakeholders defining the bounds within which they wish, for security reasons, all of their communications within INVENTCO to fall. Automatic/manual deal and no deal flags are "flags" set, as required, by all (registered) CONTRACT APP stakeholders indicating their requirements with respect to dealing with other CONTRACT APP stakeholders. This information is maintained in the data file DEAL LIST, updated information being received by way of the transaction file DEAL LIST TRANS.

Specific information from individual stakeholders differs according to the category of stakeholder involved.

Application promoters provide, amongst other things: Information for the data file, PRODUCT (updated transactions being received from the file, PRODUCT TRANS), and further information for the data file ADMIN (updated transactions being received from the file, ADMIN TRANS). Information for the data file, PRODUCT includes details of the specific products application promoters offer for trading/exchange/transfer. Information for the data file, ADMIN includes: the order pricing and matching process upon which the application is based; the consideration/entitlement "value date" regime upon which their application is based; the categories of other stakeholders allowed to participate in the application and the conditions under which they can do this; the specific rules of engagement of counter-party-guarantors by potential counterparties; the availability and, in turn, the terms and conditions for CONTRACT APP stakeholder utilization of "consideration credit", "collateralisation", and "netting" features of the application (embodied in the various post-order-processing management routines); and details of the consideration/entitlement transfer entities involved in the application and relevant security information concerning account access.

Product sponsors provide full details of the product(s) they are sponsoring; product ordering parties and potential counterparties (collectively) indicate, with respect to each other, the parties they either prefer to deal with or wish to deal with exclusively. Potential counterparties (exclusively) provide a variety of specific information, including: details of the Application promoter, Product sponsor, and Counterparty-guarantor rules under which they have chosen to operate; data recording the lines of credit (if any) offered to ordering parties and the general and specific terms and conditions of these credit lines (applicable to ordering parties individually and/or to defined classes of ordering parties); parameters with which a potential counterparty wishes to determine its consideration "bids" on orders. Counterparty-guarantors provide details of the potential counterparties (if any) they have agreed to guarantee and the nature of such guarantees. Regulators provide details of: all entities having a stake in the application and their relationships to one another (for example, which counterparty-guarantors cover which counterparties, which potential counterparties offer which products, and so on); specific regulations developed for the regime; and parameters defining the taxation treatment of all types of orders and related transactions. Consideration/entitlement transfer entities provide "set-up" and on-going account access and balance-updating services. All of the above-described information is maintained in the data file, ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

In dealing with potential counterparty primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required, amongst other things, to: define various parameters with which they wish to establish a "consideration bid" on a defined product order; and define parameters with which the potential counterparty wishes to determine adjustments to the "base-price" bids on product orders according to the specific ordering party involved (this information is maintained in the data file SEL PRICE; updated information is received by way of the transaction files SEL PRICE TRANS); define possible individual contract and product constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order; and define possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order (these latter two categories of information are maintained in the data files SEL LIMIT and BUY LIMIT; updated information being received by way of the transaction file SEL LIMIT TRANS).

In dealing with existing-contract offering party secondary order match conditions, offering parties are required, amongst other things, to specify: the Order IDs of the contracts in which the entity concerned wishes to "sell" its position as a contract stakeholder, and, for each such contract, the pricing and other parameters it requires to be satisfied before a contract position "sale" is effected. This information is maintained in the data file TRADE PRICE; updated information is received by way of the transaction file TRADE PRICE TRANS.

In dealing with potential counterparty derivative-primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required to provide essentially the same information described above in relation to primary product orders. However, in addition, information directly applicable to the relevant type of derivative-primary transaction concerned (say, an option to establish a primary product order at a later date) is also required.

In dealing with existing-contract-offering party derivative-secondary order match conditions, offering parties are required to provide essentially the same information described above in relation to secondary product orders. However, in addition, information directly applicable to the relevant type of derivative-secondary transaction concerned (say, an option to sell a position in a primary product order at a later date) is also required.

In dealing with miscellaneous information from entities external to INVENTCO, this information can be of any type and may, potentially, be used by any part of INVENTCO; the information is maintained in the data-file ADMIN with updated information being received by way of the transaction file ADMIN TRANS

Process 2

Process 2 handles the receipt and processing of "primary" risk management contract transactions, such transactions being of multiple types. Various sub-processes of Process 2 handle the receipt and processing of all possible types of these transactions, including product order processing, price quote requests, and withdrawals of existing product orders.

Primary "product orders" constitute the core "primary" risk management contract transaction type (FIG. 19 provides a summary flow chart, and the document text provides a detailed flow chart and description of the processing of this transaction type).

Primary product orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of a single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the term "Beta (X)", the term "Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is prepared to "pay" for their defined product; miscellaneous other dimensions of the ordering party's needs, and the consideration/ entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/ received). Upon its receipt, all of this information is written to—and subsequently processed from—the file PORD NEW.

Three sub-processes are involved in processing primary product orders—order authorisation, order matching, and matched order confirmation. In the case of the anticipated most typical form of order, termed a "normal-automatic" primary product order these sub-processes function as follows:

The primary product order authorisation sub-process verifies that all orders contain data appropriate to the product being sought and that each ordering party is accurately identified and credentialled (this sub-process draws principally on the data-file, PRODUCT).

The primary product order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential-counterparties, individual potential-counterparty "pricing" calculations, and counterparty selection.

The "short-listing of potential counterparties" sub-process component establishes a list of potential counterparties (if any) willing to offer the product sought by the ordering party, upon their receipt from the ordering party of a consideration they deem to be appropriate (this sub-process draws principally on the data-file, PDEAL LIST).

The individual potential-counterparties pricing calculations sub-process component utilises the above-described pricing parameters re-specified by each short-listed potential counterparty to calculate the "bid" each of them is prepared to make on the ordering-party's product order (or part thereof), and to add these to the potential counterparties short-list file (this sub-process draws principally on the data-file, PSEL PRICE).

The "counterparty selection" sub-process component extracts from the above-described "potential-counterparties short-list" file the best possible counterparty(ies) for the ordering party's transaction, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and the price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched order is deemed to be in existence (this sub-process draws principally on the data-file, PSEL LIMIT).

The matched order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the contract, including confirmation of the product ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required contract consideration (and possible other applicable fees). Automatic approvals of contracts are made by the CONTRACT APP electronically transferring resources recorded in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty (See Appendix H for a description of the consideration/entitlement "payment" process). In turn, automatic updates of the counterparty's matching constraints maintained in the file PSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, PORD QUEUE, for subsequent match attempts; matched and confirmed order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the file PORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process drawing principally on the data-file, ADMIN), records of this being written to the file PORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 3

Process 3 handles the receipt and processing of "secondary" risk management contract transactions. Like "primary" risk management contracts, "secondary" risk management contracts are of multiple types; various sub-processes of Process 3 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

"Secondary product orders" constitute the core "secondary" risk management contract transaction type (FIG. 20 provides a summary flow chart of the processing of this transaction type).

"Secondary" product orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract; the potential acquiring party's interest or otherwise in being granted credit by offering parties for the yet-to-be-determined contract acquisition amount; the acquiring party's interest or otherwise in availing themselves of the possible netting and other features of the APP concerned; the acquisition "price" range within which the potential acquiring party is prepared to "pay" for the contract they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have "relevant payments" made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file SORD NEW.

Three sub-processes are involved in processing secondary product orders—order authorisation, order matching, and matched order confirmation. In the case of the anticipated most typical form of order, termed a "normal-automatic" secondary product order these sub-processes function as follows:

The secondary product order authorisation sub-process verifies that all orders contain data appropriate to the contract sought and that each potential acquiring party is accurately identified and credentialled (this sub-process draws principally on the data-file, SPRODUCT).

The secondary product order matching sub-process locates sought-after contract records and, based on the contents of these records, determines whether a "sale" of the position of the specified stakeholder in the contract to the potential acquiring party is possible—in particular, whether the acquisition "price" range within which the potential acquiring party has specified it is prepared to "pay" for the position of the specified current stakeholder is equal to, or in excess of, the "allowable sale price" figure prespecified by the applicable contract stakeholder. If a contract "sale" is found to be possible, and there being no requirements for manual-approval intervention by any relevant stakeholder, a "match" is deemed to have occurred.

The secondary product matched order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the contract position "sale", including confirmation of the contract acquiring party's ability to immediately pay (or be granted current stakeholder credit, or acquiring party guarantor credit, for) the required "sale price" consideration (and possible other applicable fees). Automatic approvals of such "sales" are made by the CONTRACT APP electronically transferring resources recorded in the acquiring party's applicable consideration/entitlement transfer entity account to the account of the applicable current contract stakeholder.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, SORD QUEUE, for subsequent match attempts; matched and confirmed order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN), required records being written to the file SORD CONF for further "back-office" processing as required; and rejected order transactions are similarly notified to the relevant CONTRACT APP stakeholders (again, this process drawing principally on the data-file, ADMIN), required records being written to the file SORD REJ for further "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 4

Process 4 handles the receipt and processing of "derivative-primary" risk management contract transactions. Like "primary" risk management contracts, "derivative-primary" risk management contracts are of multiple types; various sub-processes of Process 4 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and existing product order withdrawals.

"Product option orders" is one illustrative "derivative-primary" risk management contract transaction type (FIG. 21 provides a summary flow chart of the processing of this transaction type).

"Derivative-primary" product option orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of a single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the term "Beta (X)", the term "Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract option consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is prepared to "pay" for their defined product option; miscellaneous other dimensions of the ordering party's needs, and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received). Upon its receipt, all of this information is written to—and subsequently processed from—the file DPORD NEW.

Three sub-processes are involved in processing derivative-primary product orders—order authorisation, order matching, and matched order confirmation. In the case of the most likely form of the above-mentioned illustrative option order, termed a "normal-automatic" derivative-primary product option order these sub-processes function as follows:

The primary product option order authorisation sub-process verifies that all orders contain data appropriate to the product option being sought and that each ordering party is accurately identified and credentialled (this sub-process draws principally on the data-file, DPPRODUCT).

The primary product option order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential option-counterparties, individual potential option-counterparty "pricing" calculations, and option-counterparty selection.

The "short-listing of potential option-counter-parties" sub-process component establishes a list of potential option-counterparties (if any) willing to offer the product option sought by the ordering party, upon their receipt from the ordering party of an option consideration they deem to be appropriate (this sub-process draws principally on the data-file, DPDEAL LIST).

The "individual potential option-counterparties pricing calculations" sub-process component utilises the above-described pricing parameters prespecified by each short-listed potential option-counterparty to calculate the "bid" each of them is prepared to make on the ordering-party's product option order (or part thereof), and to add these to the potential option-counterparties short-list file (this sub-process draws principally on the data-file, DPSEL PRICE).

The "option-counterparty selection" sub-process component extracts from the above-described "potential option-counterparties short-list" file the best possible counterparty(ies) for the ordering party's transaction, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and the price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched option order is deemed to be in existence (this sub-process draws principally on the data-file, DPSEL LIMIT).

The matched option order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the options contract, including confirmation of the product-option-ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required option product consideration (and possible other applicable fees). Automatic approvals of contracts are made by the

CONTRACT APP electronically transferring resources recorded in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty. In turn, automatic updates of the option-counterparty's matching constraints maintained in the file DPSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched option-order transactions are written to the file, DPORD QUEUE, for subsequent match attempts; matched and confirmed option-order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the reference file DP MSTR, and the file DPORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process drawing principally on the data-file, ADMIN), records of this being written to the file DPORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

If/when an option-holder wishes to exercise its option over a pre-established contract, it does so by appropriately notifying the CONTRACT APP which, in turn, retrieves the contract record from DPMSTR, effects the necessary additional consideration payments, and writes a new record to PORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 5

Process 5 handles the receipt and processing of "derivative-secondary" risk management contract transactions. Like "secondary" risk management contracts, "derivative-secondary" risk management contracts are of multiple types, various sub-processes of Process 5 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

"Product option orders" is an illustrative "derivative-secondary" risk management contract transaction type (FIG. 22 provides a summary flow chart of the processing of this transaction type).

"Derivative-secondary" product option orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract (in relation to which an option is to be purchased or sold); the potential acquiring party's Interest or otherwise in being granted credit by offering parties for the yet-to-be-determined option contract acquisition amount; the acquiring party's interest or otherwise in availing itself of the possible netting and other features of the APP concerned; the acquisition "price" range within which the potential acquiring party is prepared to "pay" for the contract option they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file DSORD NEW.

The subprocesses involved in the processing of derivative-secondary product option orders are essentially a combination of the processes described above in the case of secondary product orders (Process

3) and derivative-primary product option orders (Process 4). At the completion of the matching process, matched orders are written to the reference file DSMSTR and the file DSORD CONF for subsequent back office processing.

If/when an option holder wishes to exercise its option over a pre-established contract, it does so by appropriately notifying the CONTRACT APP which, in turn, retrieves the contract record from DSMSTR, effects the necessary additional consideration payments, and writes a new record to SORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 6

Process 6 handles the "back office" management of "matched/confirmed" primary, secondary, derivative-primary, and derivative-secondary risk management contract transactions and transactions handled by Processes 7–9. The process incorporates multiple sub-processes, collectively accessing multiple data files (FIG. 23): primary risk management contract back office processing; secondary risk management contract back office processing; derivative-primary risk management contract back office processing; derivative-secondary risk management contract back office processing; "Process 7" transactions back office processing; "Process 8" transactions back office processing; and "Process 9" transactions back office processing.

In relation to the back-office management of confirmed/matched primary risk management contracts—a number of sub-processes are involved, including: Receipt of the previous operating day's "matured-contract actual product event value" sub-process; "Start-of-day PAYACC management" sub-process; Contract maturity management sub-process; Confirmed contract processing sub-process; Information compilation and distribution sub-process; Information extraction from primary orders sub-process; Contract valuation sub-process; Contract collateralisation payments sub-process; System Access and usage fee determination and payments sub-process; Bilateral obligations netting sub-process; Multilateral obligations netting sub-process; Bilateral payments netting sub-process; Multilateral payments netting sub-process; and "end-of-day PAYACC management" sub-process.

Receipt of the previous operating day's "matured-contract actual product event value" details. This sub-process is flowcharted in FIG. 24; it involves the applicable CONTRACT APP receiving "matured-contract actual product event value" details from the relevant product sponsors (external to INVENTCO). The primary data-file, MAT PROD VALUES, is updated with this information. The support data-files, ADMIN, HISTORY, and INFO are similarly updated with applicable information.

"Start-of-day" PAYACC management. This sub-process is flowcharted in FIG. 25; it involves the applicable CONTRACT APP receiving consideration/entitlement "actual account" opening-balances from participating consideration/entitlement transfer entities (external to INVENTCO) (see Process 7 for details). The primary data-files, PAYACC SHADOW and PAYACC FINAL are updated with this information. The support data-files, HISTORY, INFO and ADMIN, are similarly updated with applicable information.

Contract maturity management. This subprocess is flowcharted in FIG. 26; It involves the applicable

CONTRACT APP determining and giving effect to primary and related entitlement-transfers to/from applicable CONTRACT APP stakeholders, applicable other INVENTCO stakeholders, where such transfers are principally reflected in entries to the data-file, PAYACC SHADOW. CONTRACT APP determines and gives effect to these transfers, principally by drawing upon product/contract information maintained in the data files, INTREG, MAT PROD VALUES, COLLAT, CREDIT MGMT, BILAT OBLIG NET, and MULTILAT OBLIG NET. These data-files are appropriately updated in the process as are the support data-files, ADMIN, HISTORY, TAX/SUB, PAYACC SHADOW and INFO.

Confirmed contract processing. This sub-process, flowcharted in FIG. 27, operates continually throughout each operating day. Details of new matched/confirmed contracts are read from the file PORD CONF and are then time-stamped and written to the file INTREG as two records—one record pertaining to the contract ordering party and the other to the contract counterparty. The support data files, INFO, ADMIN, and HISTORY are appropriately updated in the process.

Information compilation and distribution. This sub-process, flowcharted in FIG. 28, operates continually (beyond a defined operating day), drawing on the data-file INFO. As already described, INFO is updated continually as CONTRACT APP and other INVENTCO events occur, including pertinent AXSCO message information written in the first instance to HISTORY. All relevant INVENTCO stakeholders have access to preauthorised parts of INFO.

Information extraction from primary orders. This sub-process, flowcharted in FIG. 29, is effected after the completion of the defined operating day. Essentially, it involves the single task of processing the data-file, HISTORY, to yield pertinent information for the data-file INFO. One of the most important items of information drawn from HISTORY is (confidential) information on all of the prior day's potential counterparty consideration bid parameters, in particular the data items termed "assessed probabilities of occurrence". This information yields "market" information for the subsequent contract valuation sub-process.

Contract valuation. This sub-process, flowcharted in FIG. 30, draws principally upon the above-described "markets" information previously written to INFO. Pertinent data from this file is "applied against" all outstanding contracts maintained in INTREG, thereby yielding updated "future product value (FPV)", "expected value" and "distribution" value information for all contracts and, from this, revaluations of all future entitlement "expected values" and "distribution" values. All these revaluation figures are maintained in INTREG with applicable information also being written to INFO and HISTORY.

Contract collateralisation payments. This sub-process, flowcharted in FIG. 31, draws principally on the data-file INTREG. Following the contract valuation process, this collateralisation process involves relevant INTREG records being read and, depending (amongst other things) on the precalculated "present value" of the expected future entitlement associated with each relevant contract, a calculated portion of the present value of the expected future consideration amount is debited or credited to the

PAYACC SHADOW file of the applicable collateralisation trustee entity, and the product ordering party and/or counterparty as is applicable.

Generally, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a negative contract value, and if this negative value exceeds the prior contract valuation figure, the applicable entity's trust account is credited with the funds difference, with the entity's own consideration/entitlement transfer entity account being debited correspondingly. If this negative value does not exceed the prior contract valuation figure, the applicable entity's trust account is debited with the funds difference, with the entity's own consideration/entitlement transfer entity account being credited correspondingly. On the other hand, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a positive contract value, the only collateralisation payment adjustment called for is one in which all funds (if any) in the applicable entity's trust account are transferred to the entity's own consideration/entitlement transfer entity account. In each of the above-described cases, a record of all entries effected is written to the data-file, COLLAT, and a subset of this information is written to the data-files HISTORY and INFO.

System Access and usage fee determination and payments. This subprocess, flowcharted in FIG. 32, deals with the determination and payment of system access and usage fees (as distinct from contract maturity date fee payments). The function draws principally on the data-files ADMIN, and HISTORY. Fee payment parameters are maintained in data-file ADMIN. These parameters are applied against the day's new records already written to HISTORY. Debits and credits for fees so determined are written to PAYACC SHADOW with summary information written to INFO and HISTORY.

Bilateral obligations netting. This subprocess, flowcharted in FIG. 33, effectively maintains an up-to-date matrix of the present values of expected future entitlement (and other) obligations between pairs of participating ordering parties and counterparties (as well as other participating CONTRACT APP and INVENTCO stakeholders), continually adjusted on the basis of required current consideration, entitlement and other payments/receipts as they occur. As required, the function updates the above-described matrix in two stages. First, with the most recent contract revaluation figures contained within INTREG. And second, with the end-of-day payment/receipt amounts contained within PAYACC SHADOW. Consideration/entitlement transfer entity transfers from/to applicable entities are determined (according to the application-promoter specified parameters for so doing) on the basis of whether or not any/all of the adjusted bilateral present value figures are in excess of their allowable limits. These entries are written to PAYACC SHADOW, with the data-files BILAT OBLIG NET, INTREG, HISTORY, and INFO being subsequently updated.

Multilateral obligations netting. This subprocess, flowcharted in FIG. 34, is essentially the same as the bilateral netting function except that a specified "clearing/trustee" entity is effectively interposed between all bilateral counterparties and, as such, netted obligations are only between the specified "clearing house/trustee" entity and each participating entity.

Bilateral payments netting. This subprocess, flowcharted in FIG. 35, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bilaterally netted payments/receipts based on records contained in the data-file, PAYACC SHADOW. Single netted payment/receipt figures are then rewritten to PAYACC SHADOW, with the data-files BILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

Multilateral payments netting. Like bilateral payments netting, this subprocess, flowcharted in FIG. 36, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bilaterally netted payments/receipts to/from the applicable "clearing house/trustee" entity based on records contained in the data-file, PAYACC SHADOW. Single netted payment/receipt figures (to/from the "clearing house/trustee" entity) are then rewritten to PAYACC SHADOW, with the data-files MULTILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

"End-of-day" PAYACC management. This subprocess, flowcharted in FIG. 37, involves a three-stage process. First, the preparation of inter-consideration/entitlement transfer entity "balancing" transactions. Second, the transfer of the final contents of the PAYACC SHADOW data-file to the data-file, PAYACC FINAL. And third, the electronic transmission of the contents of PAYACC FINAL to the applicable consideration/entitlement transfer entities (external to INVENTCO). In turn, the subsidiary data-files, ADMIN, HISTORY, and INFO are updated.

Process 7

Process 7 handles non-CONTRACT APP-related obligation transfers between applicable INVENTCO stakeholders, that is, the transfer of ownership title over "assets" registered by INVENTCO—typically matched/confirmed contracts (recorded as CONTRACT APP INTREG records) and consideration/entitlement transfer entity resources (recorded as PAYACC records). Both of the above-mentioned items have value to their holder. This process enables holders of these items to assign or lend any portion of their holdings to others at their will through initiating the appropriate transactions as NCAROT TRANS. The process accesses a relatively small number of data files (See FIG. 38). NCAROT TRANS received result in appropriate updates to the primary data-files, PAYACC SHADOW and INTREG. In turn, the subsidiary data files, HISTORY, ADMIN and INFO are updated.

Process 8

Process 8 (flowcharted in FIG. 39) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to specialist systems to assist them decide how best to interface with one or more aspects of INVENTCO. In the case of CONTRACT APP stakeholders, the most likely users of this process, one collection of such specialist systems are termed "decision support systems". The purpose of these systems is to guide a user-stakeholder as to how it should react to/deal with the continually changing circumstances within the CONTRACT APP with which they are dealing. Different clusters of systems are applicable for different CONTRACT APP stakeholders. These systems involve a hierarchy of potentially any number of value-added components.

An example of one such system, useful to primary product ordering parties, is a system which helps an ordering party determine which of its prespecified, but as yet un-matched, orders it should withdraw and which of its potential new product orders it should submit. This system is in the form of a "utility optimization" mechanism which seeks to identify the best possible composition of outstanding orders (and thus, which existing, unmatched orders should be withdrawn and which new orders should be submitted) based on two things. First, an objective function which seeks to minimize the difference between a weighted sum of actual and desired values of a series of attributes (involving single or multiple products, covering the ordering party's "real business exposure" to each product, the ordering party's portfolio of contracts which have been "matched" but are not yet confirmed, orders which have been submitted but not yet matched, and potential yet-to-be-submitted orders (collectively termed the "buyer's objective portfolio"), these attributes including, amongst other things: the "expected value" of the objective portfolio; the "standard deviation" of the objective portfolio; the "incremental cash outflow" attribute of the objective portfolio; the "maximum absolute loss" attribute of the objective portfolio; the "expected loss" attribute of the objective portfolio; the "implied minimum return on investment" of the objective portfolio; and the "implied expected return on investment" of the objective portfolio. And second, a series of constraints specifying, amongst other things: the required "minimum values" of each objective function attribute; and required minimum product-shares in the ordering party's overall product portfolio. The mathematical form of this "optimization" could take any of a number of alternative forms.

An optimization mechanism similar to the one described above can also aid potential counterparties in defining their pricing parameters for application against incoming product orders.

Effectively, systems of the above-described type are collectively maintained as a software "library" within the applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entities independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, SSA TRANS. These requests result in the appropriate records in the file SSA being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link to INVENTCO. Appropriate records of the utilization of SSA records are written to the data-files HISTORY, ADMIN and INFO.

Process 9

Process 9 (flowcharted in FIG. 40) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to a range of INVENTCO-facilitated value added services. These services can include: accounting, reconciliation, and information services; value added information reseller services; financial services of multiple types; and data processing and telecommunications services. Effectively, software relating to these services is maintained as a software "library" within the applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entities independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT

APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, VAS TRANS. These requests result in the appropriate records in the file VAS being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link with INVENTCO. Appropriate records of the utilization of VAS records are written to the data-files HISTORY, ADMIN and INFO.

RISK MANAGEMENT CONTRACTS

Risk management contracts is a term used to refer to one type of contractual obligation which can be, but does not need to be, traded/exchanged/transferred, and subsequently processed and settled, using an INVENTCO system. Risk management contracts consist of "primary" risk management contracts; "secondary" risk management contracts; "derivative-primary" risk management contracts; and "derivative-secondary" risk management contracts.

"Primary" risk management contracts can be "simple" and "complex" in nature ("simple" contracts being derivatives of "complex" contracts).

A "simple" primary risk management contract is a tradeable or untradeable contract conveying an obligation on an entity, upon that entity being granted a consideration by another entity (or accepting a pledge to be granted a consideration by the other entity), to make an entitlement to that other entity depending on the value of a defined phenomenon, determined at a defined time in the future.

A "complex" primary risk management contract is a tradeable or untradeable contract conveying an obligation on either or both of two entities, upon one entity [usually] being granted a consideration by the other entity (or accepting a pledge to be granted a consideration by the other entity), to make an entitlement to pay/receive an entitlement from one another, depending on the value of a defined phenomenon, determined at a defined time in the future. A "complex" contract may, in turn, be "basic" or "advanced" in nature: a "complex-basic" contract being one that does not involve ordering party and/or matched order counterparty "collateralisation payments" to a third-party trustee or clearing entity during the life of a contract; and a "complex-advanced" contract being one that does involve ordering party and/or matched order counterparty "collateralisation payments" to a third-party trustee or clearing entity during the life of a contract.

"Secondary" risk management contracts are pre-existing "primary" risk management contracts offered for trade (individually or as a portfolio) by a "risk-counterparty" stakeholder to the underlying contract.

"Derivative-primary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on specified, but yet-to-be-established, primary risk management contracts.

"Derivative-secondary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on pre-existing primary risk management contracts (which may have been traded since they were first established), including instruments based on: specified, but yet-to-be established, secondary risk management contracts; and the intended tertiary trading/exchange/transfer of specified, established, secondary risk management contracts.

PROCESS 2 VARIABLES AND DATA FILES

Listed below is the file name and description therefor.

Order Data Fields

OID Unique identification assigned by CONTRACT APP to every new order submitted.

BID Ordering party identification.

BREF Ordering party's own reference for this order.

PID Order field specifying the required product.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (e.g. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from. Implied is the account consideration/entitlement, currency, national currency.

ACC ENTITL The ordering party account the contract entitlement is to be paid into. Implied is the account consideration/entitlement, currency, national currency.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining un-matched.

OPRICE Price calculated and selected for this order (this value will be the matching price).

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

DCID Defined circumstances identification.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements.

Counterparty Short List Arrays

PRICEFUNC(SID) Pricing function: function type and associated parameters.

ELFUNC(SID) Expected loss determination function: function type and associated parameters.

EVFUNC(SID) Expected value determination function: function type and associated parameters.

CR(SID) Commission rate to be used for the current defined circumstances.

DR(SID) Discount rate to be used for the current defined circumstances.

PRICE(SID) Price calculated by each counterparty.

EL(SID) Expected loss calculated for the current order by each counterparty.

AL(SID) Absolute loss calculated for the current order by each counterparty.

EV(SID) Expected values determined for the current order by each counterparty.

MCC(SID) Maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC(SID) Maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1(SID) Order expected loss limit.

ELL2(SID) Expected loss limits set by the counterparty for the product.

ELL3(SID) Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4(SID) Expected loss limits set by the counterparty for same month maturity products.

ELL5(SID) Expected loss limits set by the counterparty for orders in all products.

CEL2(SID) Current accumulated expected losses for the product.

CEL3(SID) Current accumulated expected losses for equivalent maturity date products.

CEL4(SID) Current accumulated expected losses for same month maturity products.

CEL5(SID) Current accumulated expected losses for orders in all products.

ALL1(SID) Absolute loss limit function for each contract.

ALL2(SID) Absolute loss limit function set for the product.

CAL2(SID) Current absolute limit function accumulated for the product.

EVL1(SID) Expected value limit on each order.

C-C/EDXCHANG(SID) Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG(SID) Counterparty currency exchange rates which covert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG(SID) Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC ENTITL into the product's consideration denomination.

E-CXCHANG(SID) Counterparty currency exchange rates which covert the ordering party's currency of ACC ENTITL into the product's denominated currency.

E-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

Miscellaneous Variables

BPRICE Best price selected from the PRICE(SID) array.

SID The currently selected or viewed counterparty identification.

INDEX Index counter variable required for calculating order prices.

P1 Value calculated by a pricing function at an index point.

P2 Value calculated by a pay-off function at an index point.

Master Files

FILE DESCRIPTION/CONTENTS

PORD NEW Holds details of all new orders submitted by ordering parties:

BID Ordering party identification.

BREF Ordering party's own reference for this order.

PID Order field specifying the required product.

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from.

ACC C/ED The ordering party account consideration/entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

ACC ENTITL The ordering party account the contract entitlement is to be paid into.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining un-matched.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements.

PORD QUEUE This master file holds details of orders which have already been authorised, and have attempted to match once before. Fields as in ORD NEW plus some additional fields:

OID Unique identification assigned by P-CONTRACT to every new order submitted.

PMAT Product maturity date.

C/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (e.g. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

DCID Defined circumstances identification.

PORD REJ All rejected orders reside in this file. Fields as in ORD QUEUE plus some additional fields:

ERRCODE Error code indicating why the order was rejected.

PORD CONF When an order is matched and fully confirmed, full details are stored in this master file. Fields as in ORD QUEUE plus some additional fields:

OPRICE Price calculated and selected for this order. This value will be the matching price.

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

PPRODUCT This master file holds information (definition details) about each product known to the system:

PID Product identification.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (e.g. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

PDEAL LIST This file holds a list of the ordering party/product/counterparty tuples of allowable deals to occur. Thus by specifying an ordering party (BID) and product (PID), a list of counterparties who are prepared to enter into a deal with the ordering party/product combination, can be obtained:

BID Ordering party identification

PID Product identification

SID Counterparty identification

ANON All stakeholder identifications requiring anonymous confirmation.

MANUAL All stakeholder identifications requiring manual authorisation

PSEL DC This file allows counterparties to define identifications for sets of potential order parameters. Any order data field can be used to define an order. Each defined circumstance identification is then used to set unique pricing parameters:

DCID Defined circumstances identifications.

BID Ordering party identification

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering part account the consideration is to be paid from.

ACC ENTITL The ordering party account the contract entitlement is to be paid into.

DTID Deal type identification.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PSEL PRICE Contains all counterparty pricing parameters, including commission rates, discount rates and exchange rates:

SID Counterparty identification

PID Product identification

DCID Defined circumstances identification

PRICEFUNC Pricing function: function type and associated parameters.

CR Commission rate to be used for the current ordering party in the current product.

DR Discount rate to be used for the current ordering party in the current product.

C-C/EDXCHANG Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG Counterparty currency exchange rates which covert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NCXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of

ACC ENTITL into the product's consideration denomination.

E-CXCHANG Counterparty currency exchange rates which covert the ordering party's currency of ACC ENTITL into the product's denominated currency.

E-NCXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

PSEL LIMIT Holds all counterparty portfolio limits and current accumulated exposures in the various mathematical forms allowed by the system:

SID Counterparty identification

PID Product identification

DATE Product maturity date.

MCC Maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC Maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1 Order expected loss limit.

ELL2 Expected loss limits set by the counterparty for the product.

ELL3 Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4 Expected loss limits set by the counterparty for same month maturity products.

ELL5 Expected loss limits set by the counterparty for orders in all products.

CEL2 Current accumulated expected losses for the product.

CEL3 Current accumulated expected losses for equivalent maturity date products.

CEL4 Current accumulated expected losses for same month maturity products.

CEL5 Current accumulated expected losses for orders in all products.

ALL1 Absolute loss limit function for each contract.

ALL2 Absolute loss limit function set for the product.

CAL2 Current absolute limit function accumulated for the product.

EVL1 Expected value limit on each order.

PAYACC Payment accounts for all registered stakeholders (inc. balances and previous SHADOW transactions), are stored in this master file:

ID Stakeholder identification.

NO Account number.

ACC C/ED The ordering party account consideration/entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

BALANCE Available funds.

GID Stakeholder identification guaranteeing the account.

I claim:

1. A computer-based data processing system to enable the formulation of customized multi-party risk management contracts having a future time of maturity, the system comprising:

at least one stakeholder input means by which ordering stakeholders can input contract data representing at least one offered contract in at least one predetermined phenomenon, each said phenomenon having a range of future outcomes, and said contract data specifying entitlements due at maturity for said range of future outcomes, and a consideration due to a counter-party stakeholder,

at least one counter-party stakeholder input means by which at least one counter-party stakeholder can input registering data, independent of said stakeholder entering said contract data, as to a likelihood of each outcome in said range of future outcomes for one or more of said predetermined phenomena;

a data storage means linked with each said stakeholder input means and linked with each said counter-party stakeholder input means to store said contract data and said registering data; and

data processing means, linked with the data storage means, for pricing and matching contracts from said contract data and said registering data, said pricing including calculating a counter-consideration derived from said likelihoods and said entitlements, and said matching including comparing said consideration and said counter-consideration to match an offered contract with at least one of said counter-party stakeholders.

2. The system as in claim 1, further comprising at least one other-stakeholder input means linked with the data storage means, and by which phenomena and associated range of outcomes can he input to be stored

in the data storage means to be ones of said predetermined phenomena and said range of future outcomes therefor.

3. The system as in claim 2, wherein each other-stakeholder input means is configured so that each said predetermined phenomenon and associated range of future outcomes further include a predetermined time of maturity, and said contract data and said registering data are for the time of maturity.

4. The system as in claim 2 or claim 3, wherein said registering data for each outcome represents a probability of that outcome eventuating at the time of maturity, and said counter-consideration is calculated by elemental multiplication of entitlements and the respective likelihood, all summed over the range, and adjusted at least to calculate the present day value thereof.

5. The system as in claim 4, wherein the said other-stakeholder input means is configured to receive updating data as to a present day outcome of each of the phenomena, in turn to be passed to the data storage means for recordal.

6. The system as in claim 5, wherein, on maturity of the contract, the data processing means retrieves the updated present day outcome of the respective phenomenon from the data storage means, determines an entitlement due for that outcome, and passes the entitlement to output means of the data processing system for exchange of the entitlement between the matched stakeholders.

7. The system as in claim 6, wherein said output means is linked with data communications means to remote locations where stakeholder accounts reside, and the data processing means causes transaction

of the entitlement between respective stakeholder accounts.

8. The system as in claim 4, wherein said other-stakeholder input means receives qualification data which places qualification on which of the counter-party registering data can be used to price and/or match an offered contract, the said qualification data being stored in the data storage means.

9. The system as in claim 8, wherein said qualification data is input to the input means by parties including stake-holder guarantors, and financial or institutional regulators.

10. The system as in claim 4, wherein the data processing means is configured so that a match of an offered contract is made on the basis only of a counter-consideration being less than or equal to the said consideration.

11. The system as in claim 10, wherein the data processing means is configured so that a match of an offered contract is made with a preferred one of a counter-consideration being less than or equal to the said consideration.

12. The system as in claim 4, further comprising a credit record and a debit record for each stakeholder held with an exchange Institution, the credit records and debit records for exchange of entitlements; and the data storage means of the data processing apparatus being configured to include a shadow credit record and a shadow debit record for each stakeholder, the data processing means being configured to obtain a start-of-day balance for each shadow credit record and shadow debit record, and for every transaction resulting in an exchange obligation, adjusting the

respective shadow credit record or shadow debit record, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order, and the data processing means further being configured to, at the end-of-day, instruct ones of the exchange institutions to exchange transacted credits or debits to the credit record and debit record of the respective stakeholders in accordance with the adjustments of the said permitted transactions, the credits and debits be Irrevocable, time invariant obligations placed on the exchange institutions.

13. The system as in claim 1, wherein, on a match of an offered contract, the data processing means passes the matched contract to the data storage means for recordal.

14. The system as in claim 13, wherein the output means generates confirmatory documentation for each stakeholder to a matched contract.

15. The computer-based data processing system of claim 1, further includes a second counter party stakeholder input means by which a second counter-party stakeholder can input registering data.

16. A system to enable the formulation of customized multi-party risk management contracts, the system comprising:

a plurality of main data processing devices interconnected by at least one data communications link, each said data processing device running an operating system and applications software;

one or more data storage devices to which each data processing device has access;

a plurality of data input/output channels providing connection to a plurality of stakeholder locations, each said location having data processing means, and the system being programmed for:

regulating input of data, specifying a risk phenomenon, a range of outcomes for the phenomenon, and a time of maturity;

stakeholders inputting to a said data storage device by ones of the stakeholder data processing locations contract data for an offered contract, specifying an entitlement due at maturity for each outcome in the range of outcomes for a one of the predetermined phenomena, and an amount payable to a seller;

counter-party stakeholders inputting to a data storage device by ones of the stakeholder data processing locations registering data, independent of contract data entered by stakeholders, as to a likelihood of occurrence of each outcome in the range of outcomes for at least one of the predetermined phenomena;

pricing and matching a contract by the main data processing devices for at least one of the offered contracts from the seller registered data by: for an offered contract, selecting the registering data for the respective phenomenon and, in response to entitle-ments specified for each outcome in the range of outcomes for the phenomenon, calculating a counter- consideration, and, by comparison of the calculated counter-consideration with the consideration, matching an offered contract with at least one counter-party stakeholder.

17. The system as in claim 16, further comprising output means for each distributed data processing location whereby, on a match of a contract, confirmation is output in the form of data or documentation to respective output means for the matched stakeholders.

18. A method to enable the formulation of customized multi-party risk management contracts having a future time of maturity, the method comprising the steps of:

(a) inputting into data processing apparatus, by at least one ordering stakeholder input means thereof, contract data representing at least one offered contract in at least one predetermined phenomenon having a range of future outcomes, and said contract data specifying entitlements due at maturity for the range of future outcomes, and consideration due to a counter-party stakeholder,

(b) inputting into said data processing apparatus, by at least one counter-party stakeholder input means thereof, counter-party registering data, independent of at least one ordering stakeholder entering contract data, as to a likelihood of each outcome in said range of future outcomes for one or more of said predetermined phenomena;

(c) storing, in a data storage means of said data processing apparatus linked with each said stakeholder input means and linked with each said counter-party stake-holder input means, said contract data and said registering data; and

(d) pricing and matching at least one of the offered contracts by data processing means of the data processing apparatus linked with said data storage means, said pricing and matching comprising the steps, for each offered contract, of:

(i) calculating a counter-consideration derived from said likelihoods and said entitlements;

(ii) comparing said consideration and said counter-consideration; and

(iii) matching a contract on the basis of said comparison.

19. The method as in claim 18, comprising the further step, before step (a), of:

(aa) inputting into said data processing apparatus, by at least one other other-stakeholder Input means thereof, predetermining data of a said phenomenon and an associated range of outcomes.

20. The method as in claim 19, wherein the step (at) further comprises inputting a predetermined time of maturity for each predetermined phenomenon and associated range of outcomes.

21. The method as in claim 20, wherein the registering data for each outcome represents a likelihood of that outcome eventuating at the time of maturity, and the step (d)(i) is performed by

multiplying elemental entitlements for each outcome with the respective likelihood;

summing the products for the range of outcomes; and adjusting the sum at least to calculate a present day value thereof to give the counter-party consideration.

22. The method as in claim 21, comprising the further steps, following step (d), of:

(h) inputting, by the other-stakeholder input means, qualification data on which of the counter-party registering data can be used to price an offered contract.

23. The method as in claim 21, wherein the step (d)(iii) is performed by considering those counter-considerations being only less than or equal to said consideration.

24. The method as in claim 23, wherein the step (d)(iv) is performed by matching a preferred one of the counter-considerations being less than or equal to the said consideration.

25. The method as in claim 19, comprising the further step following step (d) of

(c) inputting, by the other-stakeholder input means, data representing a present day outcome of each phenomenon.

26. The method as in claim 25, comprising the further steps, following step (e) of, at the time of maturity:

(f) calculating the entitlement for the updated present day outcome; and

(g) exchanging the entitlement between matched stakeholders.

27. The method as in claim 18 or claim 19 comprising the further step, following step (d), and before the time of maturity, of:

(m) a party to a matched contract offering a stake in the contract to other parties in exchange for a consideration, and, on acceptance of the stake and exchange of the consideration by another party, that other party hemming a stakeholder to the contract.

28. The method as in claim 18, wherein each stakeholder holds a credit record and a debit record with an exchange institution, the credit record and debit record for exchange of entitlements, the method comprising the further steps, following step (d), of:

(i) creating a shadow credit record and a shadow debit record for each stakeholder to be held independently by the data processing apparatus from the exchange institutions;

(j) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;

(k) for every translation resulting In an exchange obligation, the supervisory institution adjusting each respective shadow credit record or shadow debit record, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and

(l) at the end-of-day, the data processing apparatus instructing ones of the exchange institutions to exchange transacted credits or debits to the credit record and debit record of the respective stakeholders in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

29. The method as in claim 28, wherein the end-of-day instructions represent credits and debits netted throughout the day for each stakeholder in respect of all the transactions of that day.

30. The method as in claim 18, comprising the further step following step (d) of:

(n) passing matched contracts to the data storage means for recordal.

31. The method as in claim 30, comprising the further step following step (n) of:

(o) generating confirmatory documentation for each stakeholder for each matched contract.

32. A method of making a computer system, the method comprising the steps of:

(a) interconnecting at least one stakeholder data input means and at least one counter-stakeholder data input means to data storage means;

(b) interconnecting the data storage means with data processing means;

(c) interconnecting the data processing means with output means; and

(d) programming the data processing means to:

(i) accept stakeholder input data of contract data representing at least one offered contract, each offered contract specifying a predetermined phenomenon, each phenomenon having a range of future outcomes, and each said contract data having a future time of maturity, an entitlement due for each outcome in said range of outcomes, and a consideration payable to a counter-party stakeholder;

(ii) accept counter-stakeholder registering data, independent of said stakeholder input data being accepted, as to a likelihood of each outcome in said range of future outcomes for each one or more of said phenomena;

(iii) process the contract data and the registering data to price and match a contract, said pricing including: selecting the registering data corresponding to the time of maturity for each predetermined phenomenon, and calculating a counter-consideration derived from said entitlements and said likelihoods; and said matching including com-paring said consideration and said counter-consideration to match an offered contract with at least one of said counter-party stakeholders; and

(iv) output confirmatory data or documentation for each matched contract.

33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

(a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;

(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;

(c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order, and

(d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

34. The method as in claim 33, wherein the end-of-day instructions represent credits and debits netted throughout the day for each party in respect of all the transactions of that day.

35. A data processing system to enable the formulation of customized multi-patty risk management contracts, the system comprising:

at least one stakeholder input means by which ordering stakeholders can input contract data representing at least one offered contract in at least one predetermined phenomenon, each said phenomenon having a future outcome at a time of maturity, and said contract data specifying an entitlement due at maturity for, each outcome in a range of future outcomes;

at least one counter-party stakeholder input means by which at least one counter-party stakeholder can input registering data, independent of said stakeholders inputting said contract data, for one or more of said predetermined phenomena;

a data storage means linked with each said stakeholder input means and linked with each said counter-party stakeholder input means to store said contract data and said registering data; and

data processing means, linked with the data storage means, for pricing and matching contracts from said contract data and said registering data, said pricing including calculating counter-considerations derived from said registering data relating to the phenomenon of the contract data, and said matching including comparing said counter-considerations to match an offered contract with at least one of said counter-party stakeholders.

36. A data processing system to enable the formulation of customized potential multi-party risk management contracts, the system comprising:

at least one stakeholder input means by which ordering stakeholders can input contract data representing at least one offered contract in at least one predetermined phenomenon, each said phenomenon having a future outcome at a time of maturity, and said contract data specifying an entitlement due at maturity for each outcome in a range of future outcomes;

at least one counter-party stakeholder input means by which at least one counter-party stakeholder can input registering data, independent of said stakeholders inputting said contract data, for one or more of said predetermined phenomena;

a data storage means linked with each said stakeholder input means and linked with each s aid counter-party stakeholder input means to store said contract data and said registering data; and

data processing means, linked with the data storage means, for pricing contracts from said contract data and said registering data, said pricing including calculating counter-considerations derived from said registering data relating to the phenomenon of the contract data.

37. A data-processing system to enable the formulation of customized multi-party risk management contracts, the system comprising:

at least one stakeholder input means by which ordering stakeholders can input contract data representing at least one offered contract in at least one predetermined phenomenon, each said phenomenon having a future outcome at a time of maturity, and said contract data specifying an entitlement due at maturity for each outcome in a range of future outcomes;

at least one counter-party stakeholder input means by which at least one countcr-party stakeholder can input registering data, independent of said stakeholders inputting said contract data, for one or more of said predetermined phenomena;

a data storage means linked with each said stakeholder input means and linked with each said counter-party stakeholder input means to store said contract data and said registering data; and

data processing means, linked with the data storage means, for pricing and matching contracts from said contract data and said registering data, said pricing including calculating counter-considerations for each outcome in said range derived from said registering data relating to the phenomenon of the contract data, and said matching including comparing said counter-considerations for each outcome in said range and over said range to match an offered contract with at least one of said counter-party stakeholders.

38. A data processing system to enable the formulation of customized multi-party risk management contracts, the system comprising:

at least one stakeholder input means by which ordering stakeholders can input contract data representing at least one offered contract in at least one predetermined phenomenon, each said phenomenon having a future outcome at a time of maturity, and said contract data specifying an entitlement due at maturity for each outcome in a range of future outcomes;

at least one counter-party stakeholder input means by which at least one counter-party stakeholder can input registering data, independent of said stakeholders inputting said contract data, for one or more of said predetermined phenomena;

a data storage means linked with each said stakeholder input means and linked with each said counter-party stakeholder input means to store said contract data and said registering data; and

data processing means, linked with the data storage means, for pricing and matching contracts from said contract data and said registering data, said pricing including dividing the entitlement into integer components, and, for each component, calculating counter-considerations derived from said registering data relating to the phenomenon of the contract data, and said matching including comparing each component said counter-considerations to match an offered contract with at least one of said counter-party stakeholders.

39. A data processing system to enable the formulation of customized multi-party risk management contracts, the system comprising:

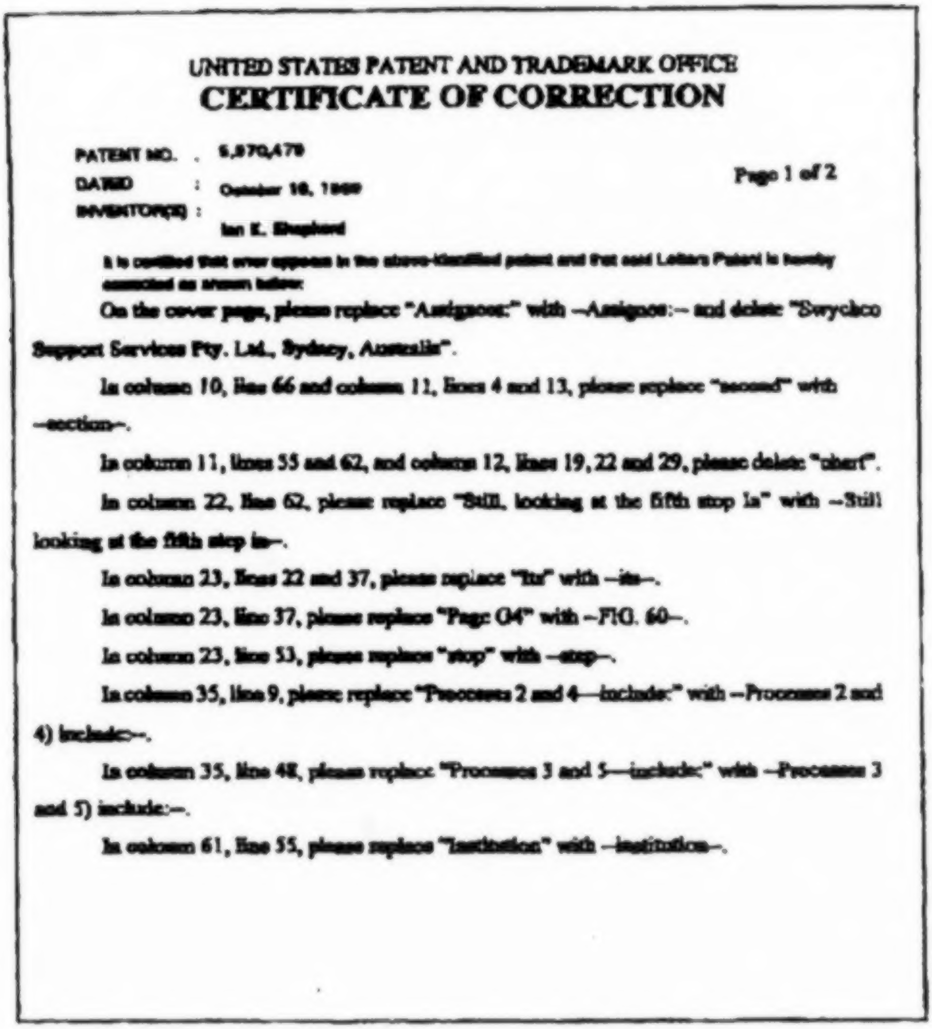
at least one stakeholder input means by which ordering stakeholders can input contract data representing at least one offered contract in at least one predetermined phenomenon, each said phenomenon having a future outcome at a time of maturity, and said contract data specifying an entitlement due at maturity for each outcome in a range of future outcomes;

at least one counter-party stakeholder input means by which at least one counter-party stakeholder can input registering data, independent of said stakeholders inputting said contract data, for one or more of said predetermined phenomena;

a data storage means linked with each said stakeholder input means and linked with each said counter-party stakeholder input means to store said contract data and said registering data; and

data processing means, linked with the data storage means, far pricing and matching contracts from said contract data and said registering data, said pricing including calculating counter-considerations derived from said registering data relating to the phenomenon of the contract data, and said matching including comparing said counter-considerations to match an offered contract with at least one of said counter-party stakeholders, and further for periodically repricing the ordering data of matched contracts, said repricing including calculating counter-considerations derived from at least some of said registering data relating to the phenomenon of the contract.

* * * * *



UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,970,479

DATED : October 19, 1999

INVENTOR(S) : Ian K. Shepherd

Page 1 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the cover page, please replace "Assignees:" with --Assignee:-- and delete "Swychco Support Services Pty. Ltd., Sydney, Australia".

In column 10, line 66 and column 11, lines 4 and 13, please replace "second" with --section--.

In column 11, lines 55 and 62, and column 12, lines 19, 22 and 29, please delete "chart".

In column 22, line 62, please replace "Still, looking at the fifth stop in" with --Still looking at the fifth step in--.

In column 23, lines 22 and 37, please replace "Its" with --its--.

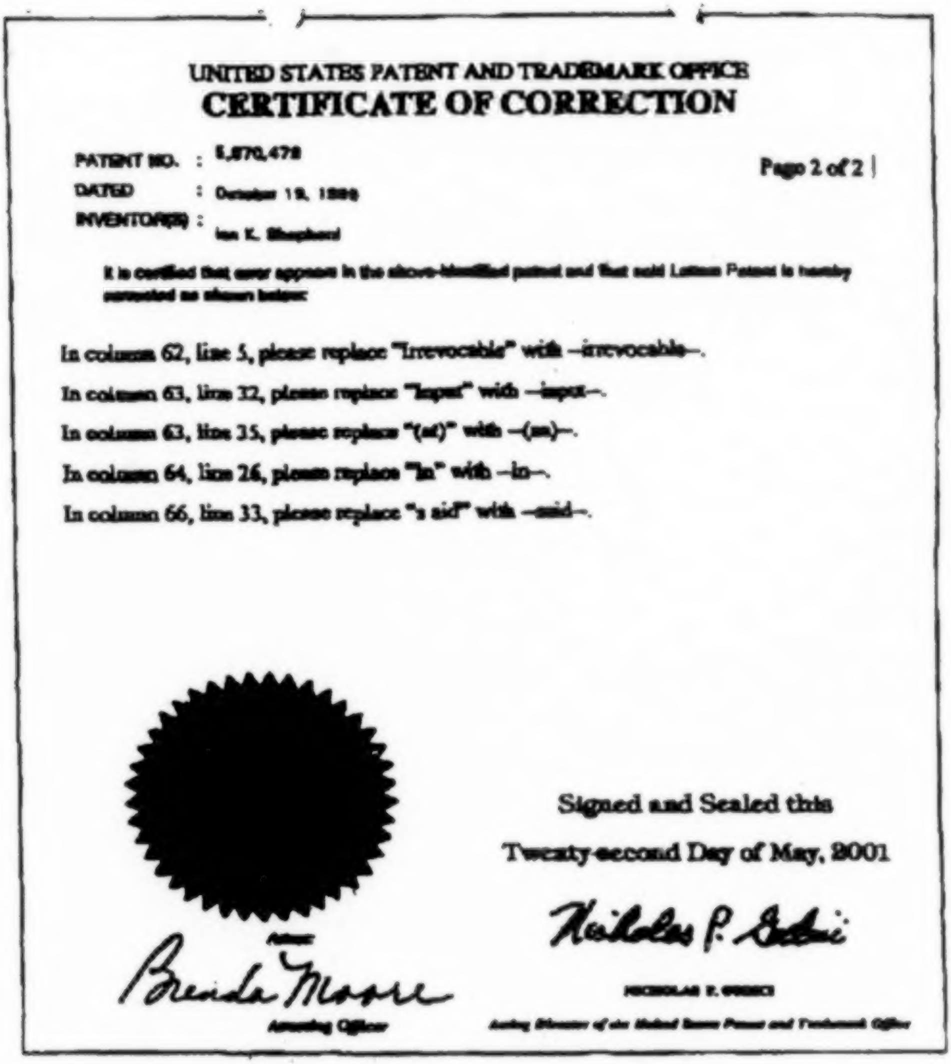
In column 23, line 37, please replace "Page 64" with --FIG. 60--.

In column 23, line 53, please replace "stop" with --step--.

In column 35, line 9, please replace "Processes 2 and 4—include:" with --Processes 2 and 4) include:--.

In column 35, line 48, please replace "Processes 3 and 5—include:" with --Processes 3 and 5) include:--.

In column 61, line 55, please replace "Instinction" with --institution--.



UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,970,479
DATED : October 19, 1999
INVENTOR(S) : Ian K. Shepherd

Page 2 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 62, line 5, please replace "Irrevocable" with –irrevocable–.

In column 63, line 32, please replace "Input" with –input–.

In column 63, line 35, please replace "(at)" with –(an)–.

In column 64, line 26, please replace "In" with –in–.

In column 66, line 33, please replace "s aid" with –said–.

Signed and Sealed this

Twenty-second Day of May, 2001

Attest:

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Acting Director of the United States Patent and Trademark Office

No. 13-298

RECORD AND BRIEFS

IN THE

Supreme Court of the United States

JAN 21 2014

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,

Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

JOINT APPENDIX: VOLUME II OF III

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CERTIORARI GRANTED DECEMBER 6, 2013

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Exhibit 7: Terminal Disclaimer To Obviate A Double Patenting Rejection Over A Prior Patent, dated October 31, 2003, from the prosecution history for U.S. Patent No. 6,912,510 1301

Exhibit 8: Office Action, dated December 28, 2005, from the prosecution history for U.S. Patent No. 7,149,720 1302

Exhibit 9: Terminal Disclaimer To Obviate A Double Patenting Rejection Over A "Prior" Patent, dated January 27, 2006, from the prosecution history for U.S. Patent No. 7,149,720 1308

Exhibit 10: Terminal Disclaimer To Obviate A Double Patenting Rejection Over A "Prior" Patent, dated September 11, 2008, from the prosecution history for U.S. Patent No. 7,725,375 1309

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Exhibit 4: *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101*, dated August 24, 2009 1442

Exhibit 5: *Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of Bilski v. Kappos*, published in Federal Register, volume 75, number 143, page 43,922, dated July 27, 2010 1462

Exhibit 6: Transcript of Status Conference before Judge Collyer, dated August 6, 2010 1489

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Exhibit 8: U.S. Patent and Trademark Office *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101* Training Materials, dated August 215, 2009 .. 1516

NOTICE

The following documents have been omitted from the printing of this Joint Appendix. They may be found in the Petitioner's Appendix to the 13-298 Petition For A Writ Of Certiorari at the following pages:

CLS Bank Int'l v. *Alice Corp.*, 717 F.3d 1269 (Fed. Cir. 2013).. 1a

CLS Bank Int'l v. *Alice Corp.*, 685 F.3d 1341 (Fed. Cir. 2012).. 132a

CLS Bank Int'l v. *Alice Corp.*, 768 F. Supp. 2d 221 (D.D.C. 2011).. 172a

CLS Bank Int'l v. *Alice Corp.*, 484 F. App'x 559 (Fed. Cir. 2012).. 239a

EXHIBIT 2

(12) United States Patent

Shepherd

(10)	Patent No.:	US 6,912,510 B1
(45)	Date of Patent:	*Jun. 28, 2005

---

(54) METHODS OF EXCHANGING AN OBLIGATION

(75) Inventor: Ian Kenneth Shepherd, Toorak (AU)

(73) Assignee: Alice Corporation PTY LTD, Melbourne (AU)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: 09/567,507

(22) Filed: May 9, 2000

Related U.S. Application Data

(63) Continuation of application No. 08/870,691, filed on Jun. 6, 1997, now Pat. No. 6,134,536, which is a continuation-in-part of application No. 08/070,136, filed on May 28, 1993, now Pat. No. 5,970,497, and a continuation-in-part of application No. PCT/AU95/00827, filed on Dec. 7, 1995.

(30) Foreign Application Priority Data

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Jul. 12, 1994	(AU)	PM9922
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(51) Int. Cl.^{7} 06F 17/60

(52) U.S. Cl. 705/37

(58) Field of Search 705/35, 36, 37,
705/38, 39, 10, 80

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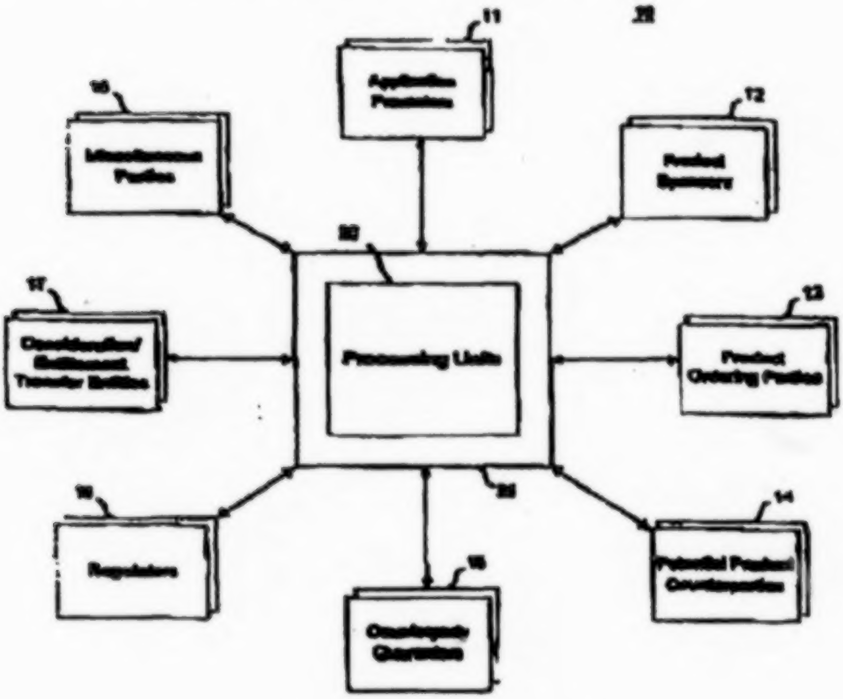
Primary Examiner—Vincent Millin Assistant *Examiner*—Sandra Snapp

(74) *Attorney Agent, or Firm*—Sterne, Kessler, Goldstein & Fox PLLC

(57) ABSTRACT

A method of exchanging an obligation between parties where the exchange is administered by a supervisory institution that ensures real-time settling of obligations between parties by updating shadow records in real-time and instructing one or more exchange institutions to effect, from time to time, the exchange of obligations in accounts maintained external to the supervisory institution. Updates to the exchange institution accounts may reflect the net obligations of parties over a nominated period of time. The role of the supervisory institution is to ensure that obligations are only settled where parties have sufficient balance in their shadow records to complete the transaction. Obligations that can be exchanged include, but are not limited to: shares in financial or physical assets, participation rights in wagers, national or synthetic currencies, exchange settlement account deposits, taxation account deposits, and deposits of financial instruments or precious metals.

75 Claims, 117 Drawing Sheets


11
22
Application Providers
16
Miscellaneous Parties
12
Product Sponsors
20
17
Clearinghouses/ Settlement Transfer Entities
Processing Units
13
Product Ordering Parties
18
Regulators
25
14
Potential Product Counterparties
15
Counterparty Guarantors

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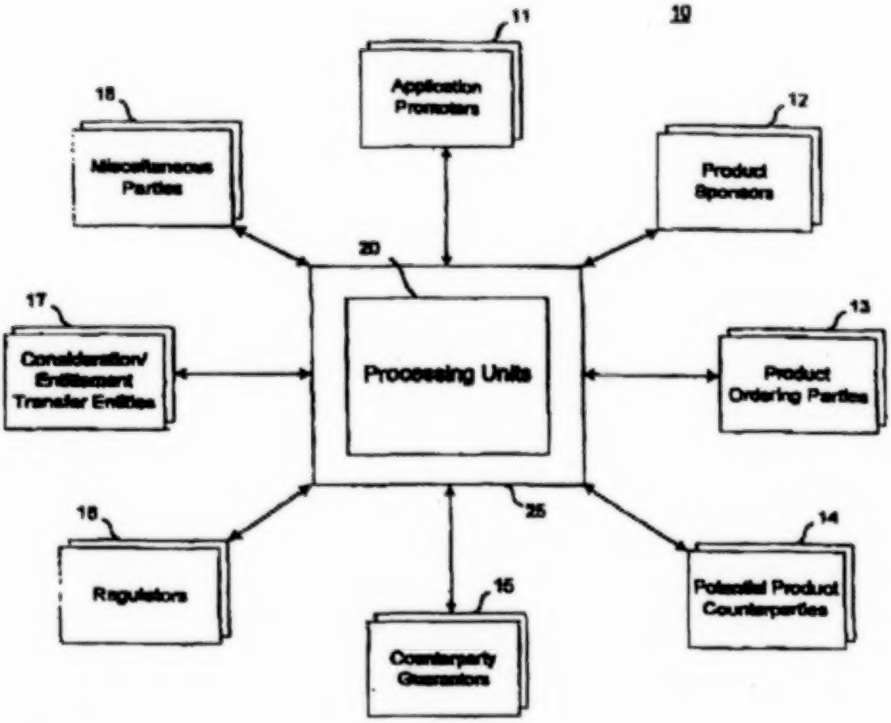

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11
Application Promoters
12
Product Sponsors
13
Product Ordering Parties
14
Potential Product Counterparties
15
Counterparty Guarantors
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Regulators
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Consideration/ Entitlement Transfer Entities
18
Miscellaneous Parties
20
Processing Units
25

FIG. 1

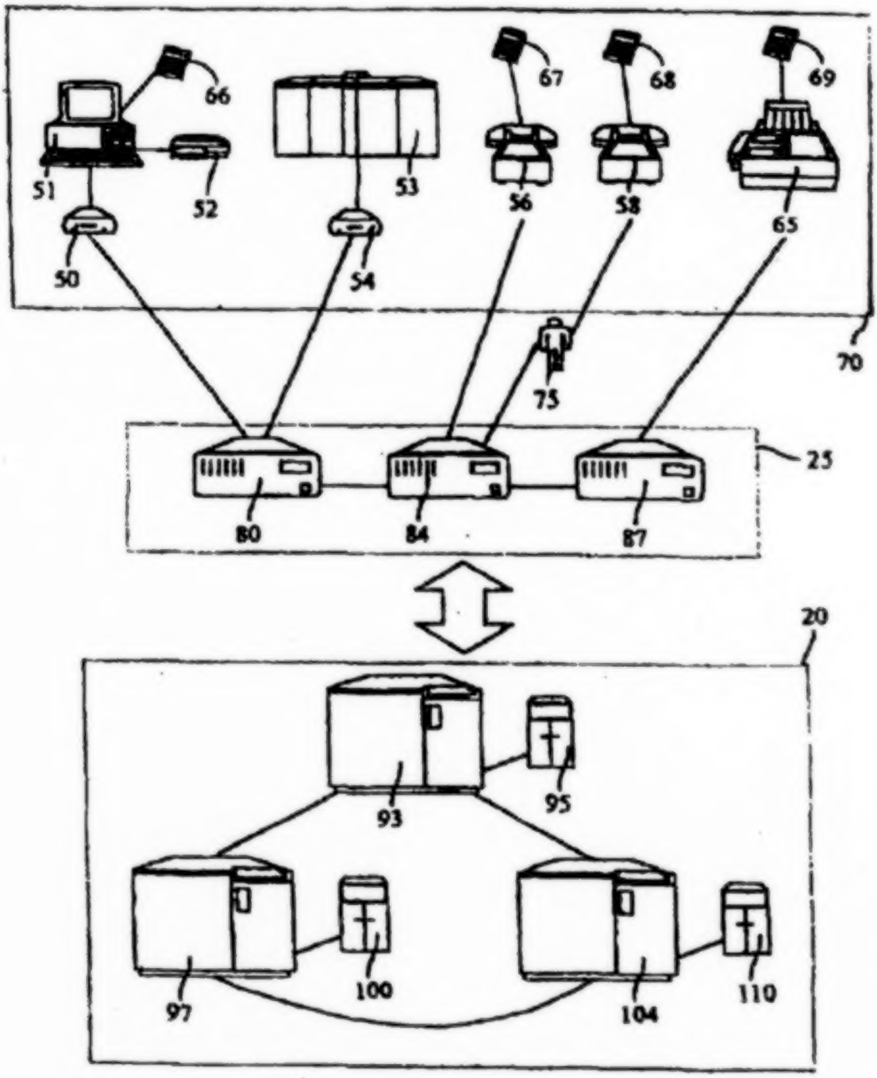

Fig. 2a

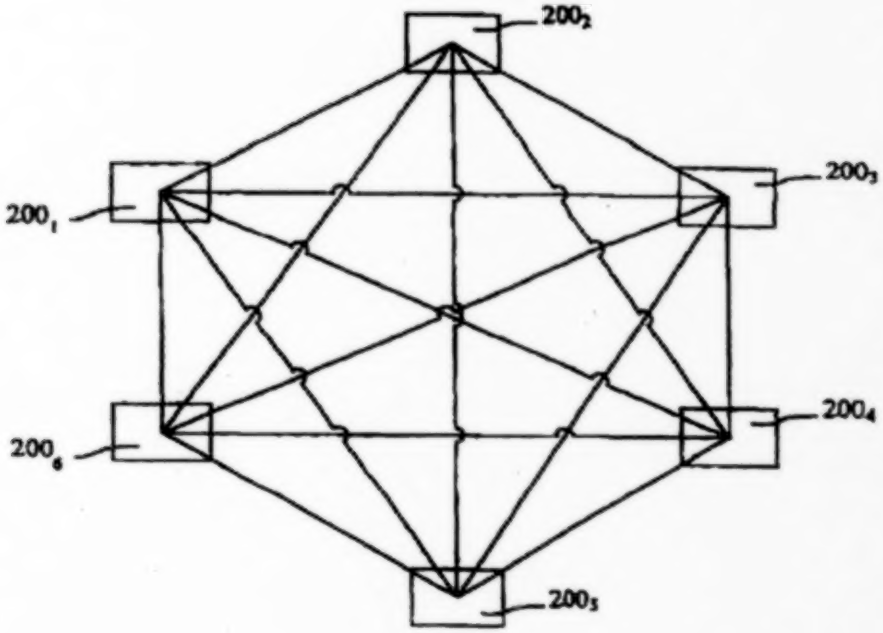
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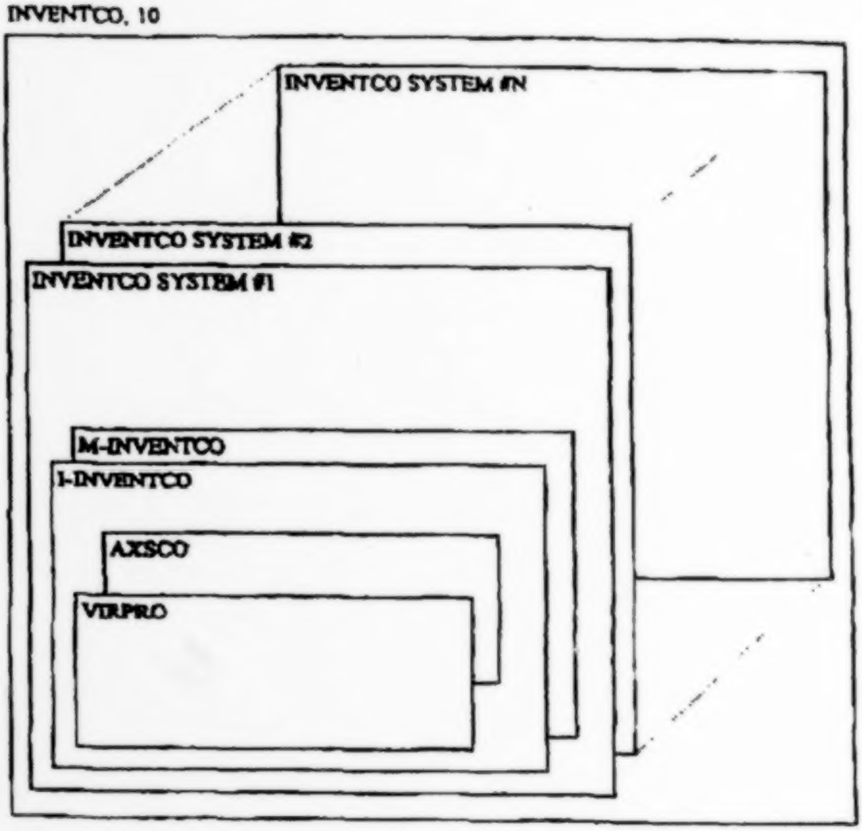
Fig. 2b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VIRPRO

Fig. 3

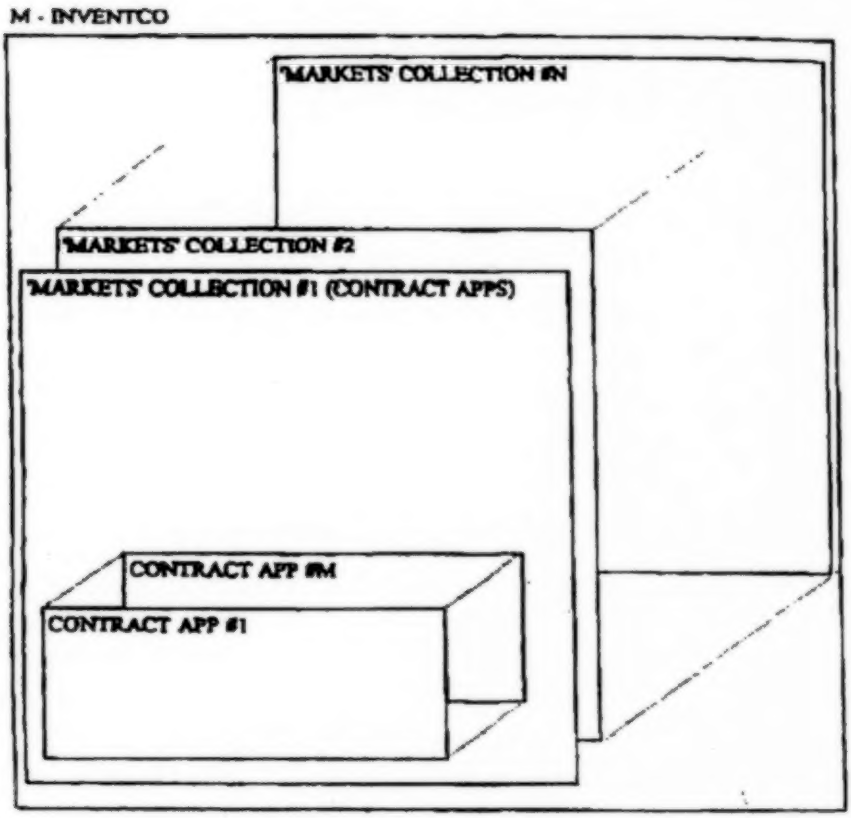

M - INVENTCO
'MARKETS' COLLECTION #N
'MARKETS' COLLECTION #2
'MARKETS' COLLECTION #1 (CONTRACT APPS)
CONTRACT APP #M
CONTRACT APP #1

Fig. 4

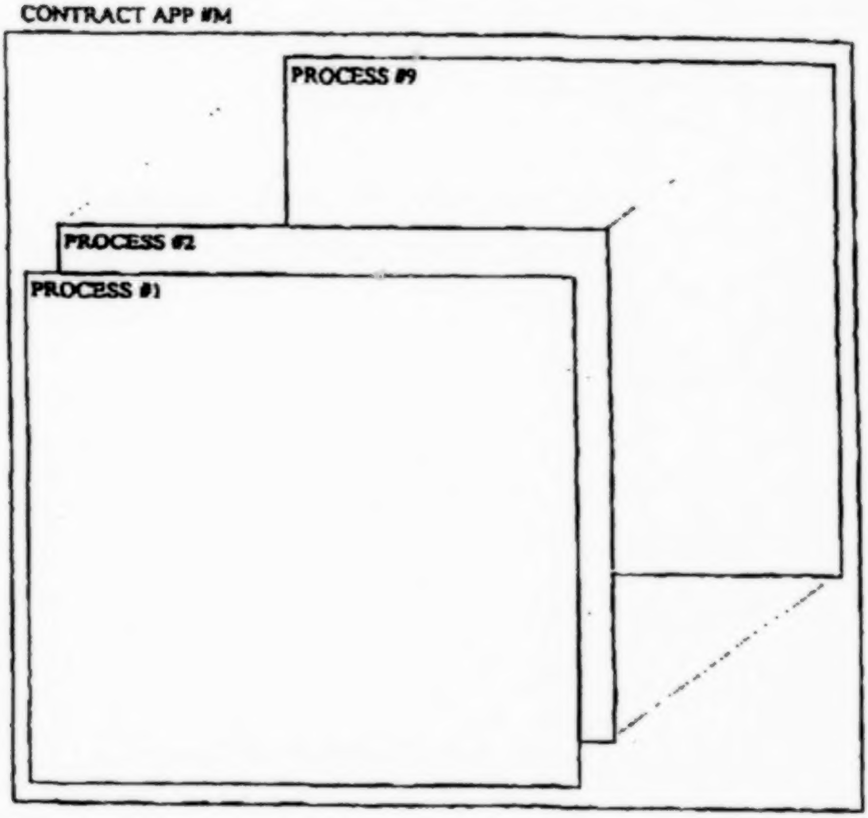
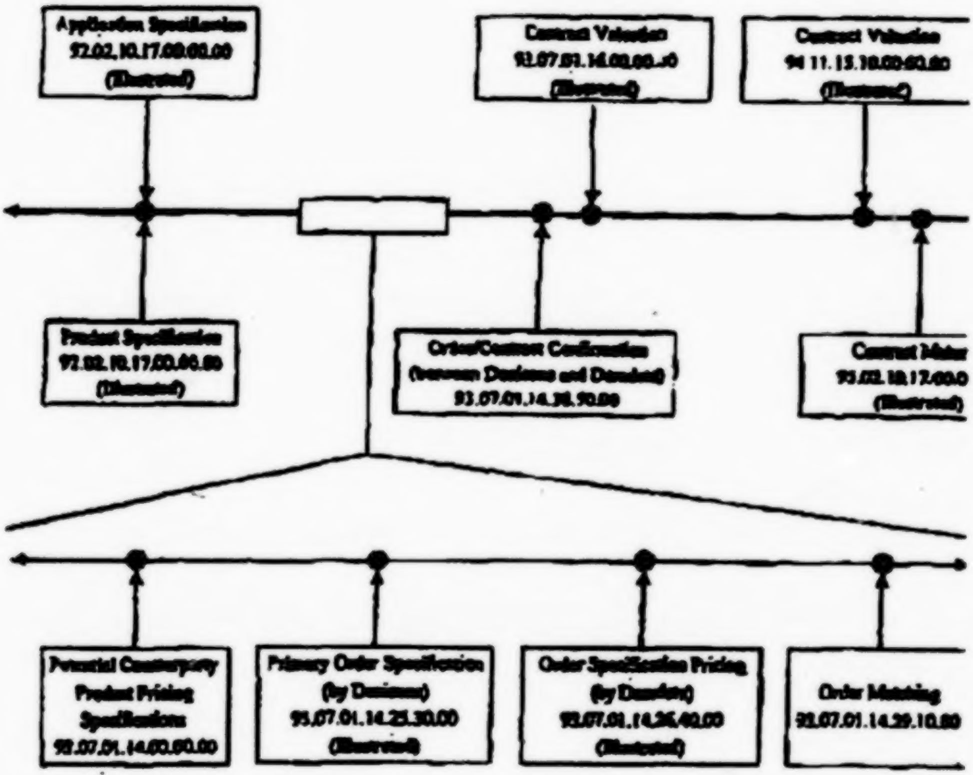

CONTRACT APP #M
PROCESS #9
PROCESS #2
PROCESS #1

Fig. 5

EXAMPLE I


Application Specification
92.02.10.17.00.00.00
(Illustrated)
Contract Valuation
93.07.01.14.00.00.00
(Illustrated)
Contract Valuation
94.11.15.10.00.00.00
(Illustrated)
Product Specification
92.02.10.17.00.00.00
(Illustrated)
Order/Contract Confirmation
(between Dominant and Dominated)
93.07.01.14.38.50.00
Contract Matur
93.02.10.17.00.0
(Illustrated)
Potential Counterparty
Product Pricing
Specifications
93.07.01.14.00.00.00
Primary Order Specification
(by Dominant)
93.07.01.14.25.30.00
(Illustrated)
Order Specification Pricing
(by Dominated)
93.07.01.14.26.40.00
(Illustrated)
Order Matching
93.07.01.14.29.10.00

EXAMPLE II

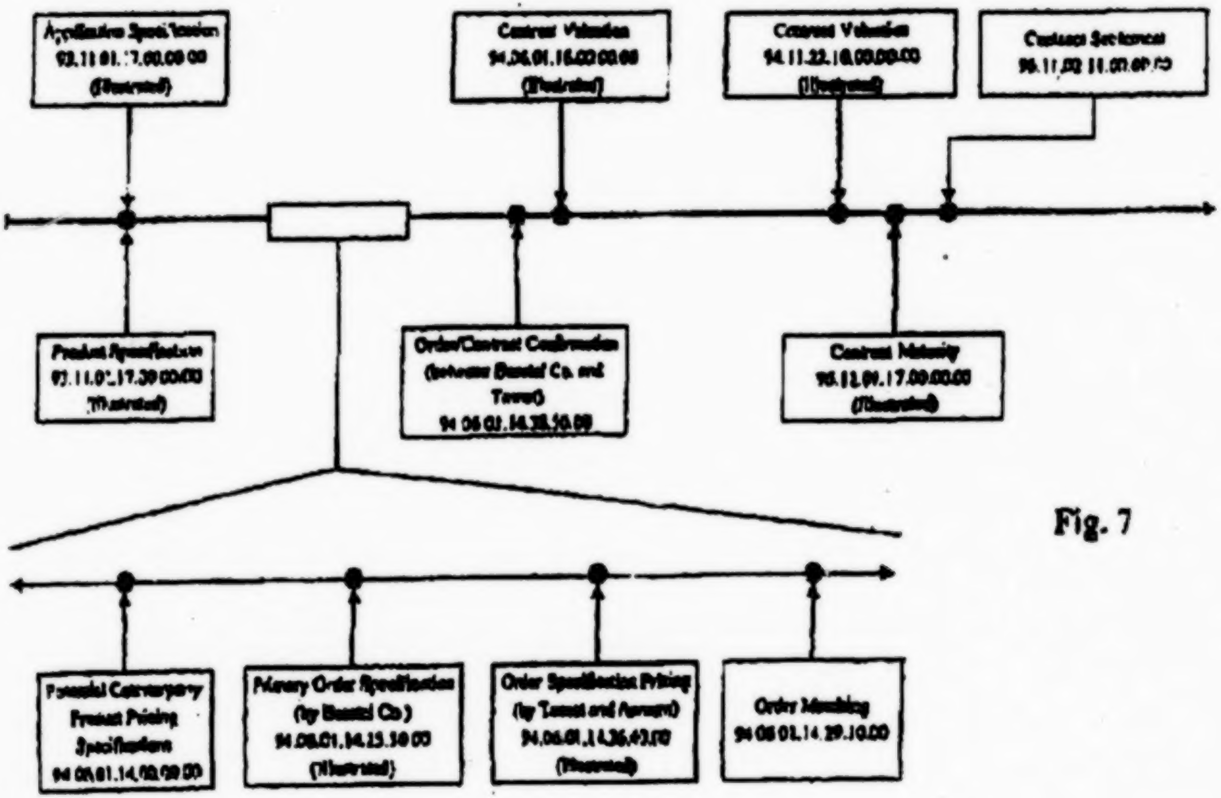

Application Specification
93.11.01.17.00.00.00
(Illustrated)
Contract Valuation
94.06.01.16.00.00.00
(Illustrated)
Contract Valuation
94.11.22.16.00.00.00
(Illustrated)
Contract Settlement
95.11.02 11.00.00.00
Product Specification
93.11.01.17.30.00.00
(Illustrated)
Order/Contract Confirmation
(between Bestel Co. and Tenant)
94.06.01.14.38.50.00
Contract Maturity
95.12.01.17.00.00.00
(Illustrated)
Potential Counterparty
Product Pricing
Specification
94.06.01.14.02.00.00
Primary Order Specification
(by Bestel Co.)
94.06.01.14.25.30.00
(Illustrated)
Order Specification Pricing
(by Tenant and Acceptor)
94.06.01.14.26.43.00
(Illustrated)
Order Matching
94.06.01.14.29.10.00

Fig. 7

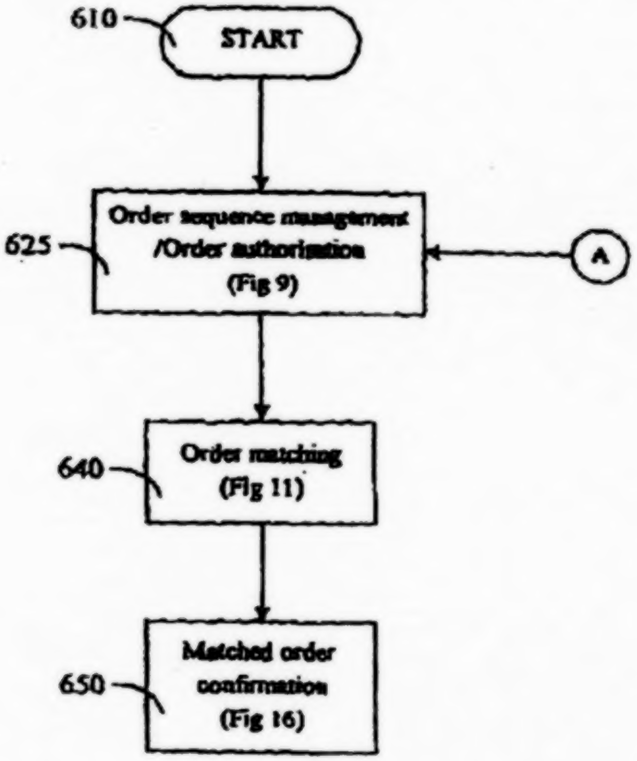

610
START
625
Order sequence management
/Order authorisation
(Fig 9)
A
640
Order matching
(Fig 11)
650
Matched order
confirmation
(Fig 16)

Fig. 8

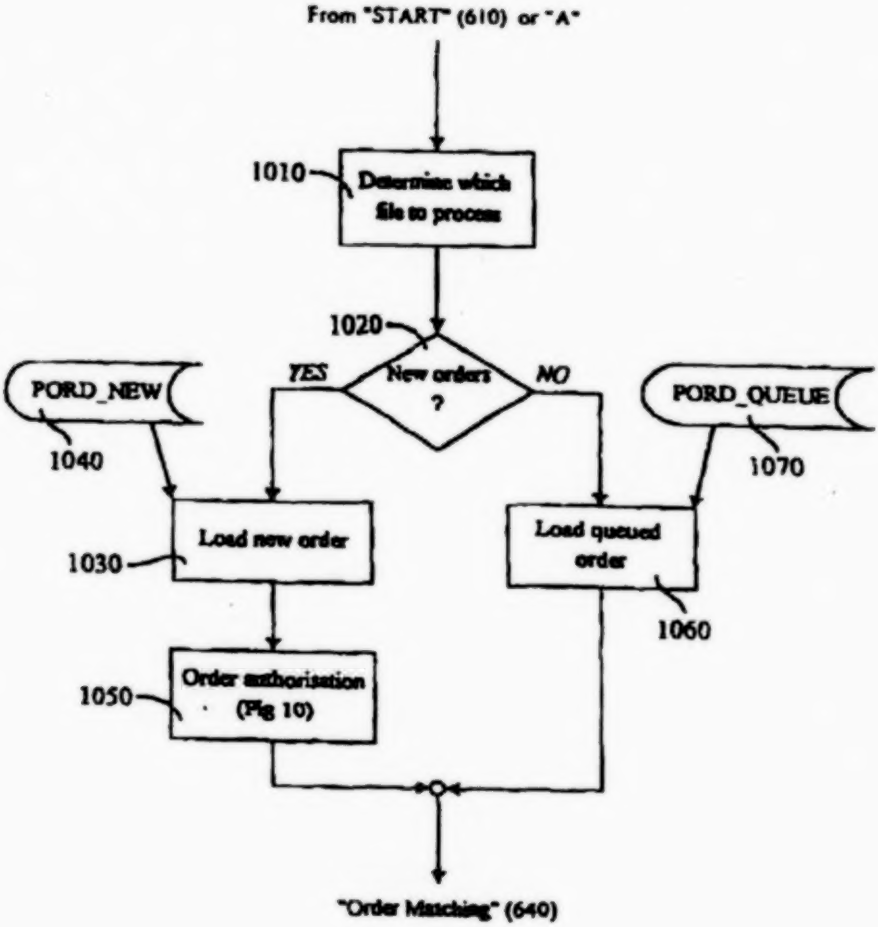

From "START" (610) or "A"
1010
Determine which file to process
1020
New orders ?
YES
NO
PORD_NEW
1040
PORD_QUEUE
1070
Load new order
1030
Load queued order
1060
Order authorisation (Fig 10)
1050
"Order Matching" (640)

Fig. 9

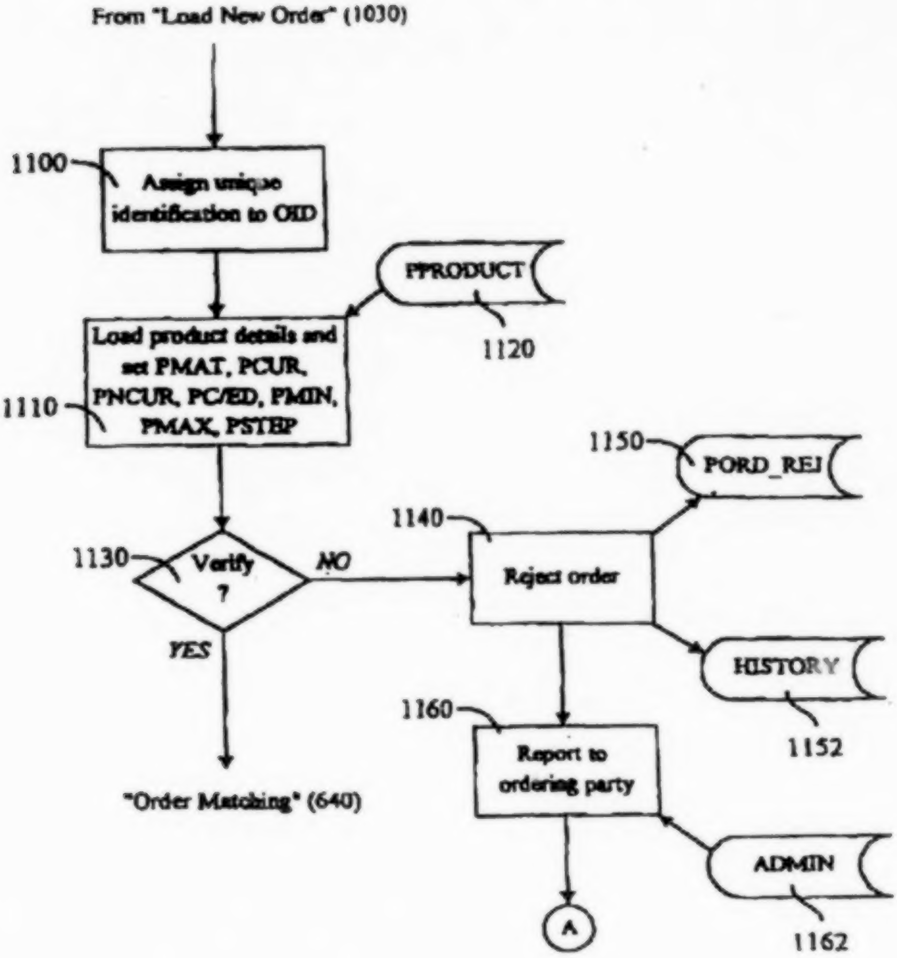

From "Load New Order" (1030)
1100
Assign unique identification to OID
PPRODUCT
1120
Load product details and set PMAT, PCUR, PNCUR, PC/ED, PMIN, PMAX, PSTEP
1110
1150
PORD_REJ
1140
1130
Verify ?
NO
Reject order
YES
HISTORY
1160
1152
Report to ordering party
"Order Matching" (640)
ADMIN
A
1162

Fig. 10

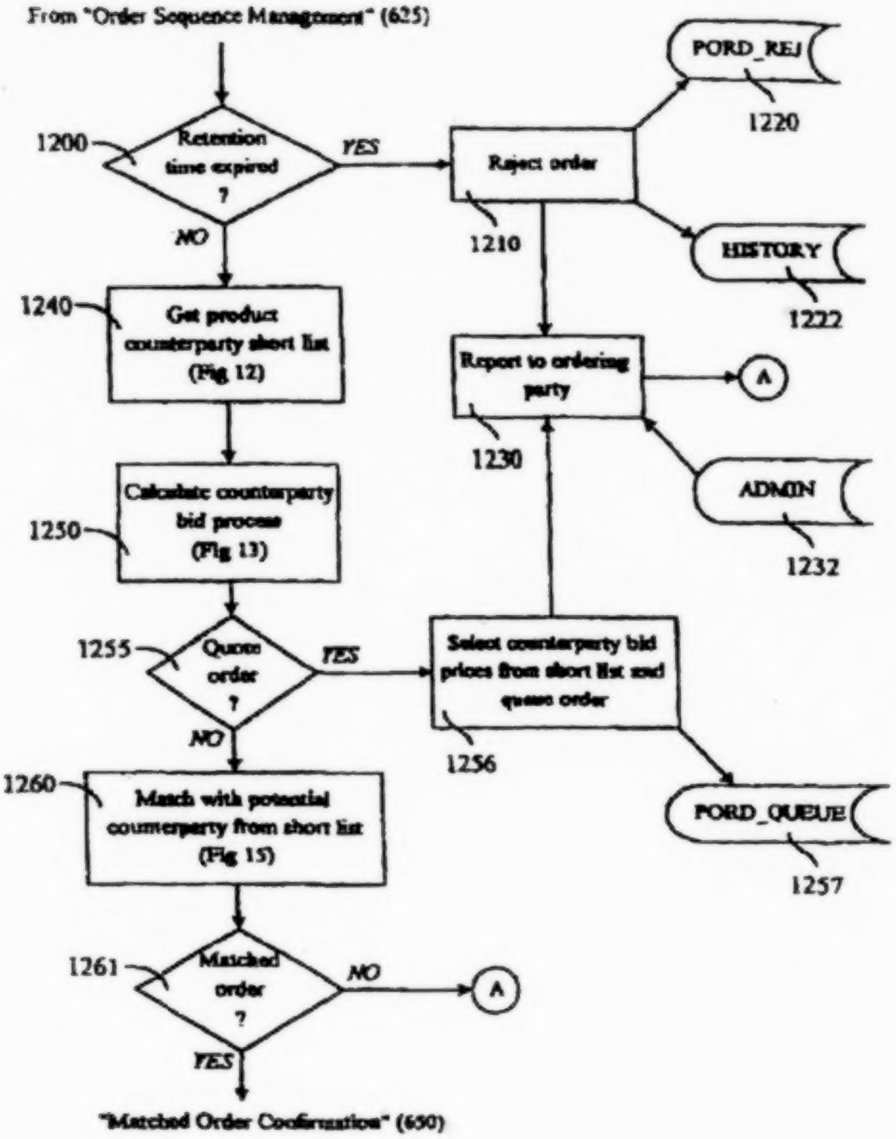

From "Order Sequence Management" (625)
1200
Retention time expired ?
YES
NO
Reject order
1210
PORD_REJ
1220
HISTORY
1222
1240
Get product counterparty short list (Fig 12)
Report to ordering party
1230
A
ADMIN
1232
Calculate counterparty bid process (Fig 13)
1250
1255
Quote order ?
YES
NO
Select counterparty bid prices from short list and queue order
1256
PORD_QUEUE
1257
1260
Match with potential counterparty from short list (Fig 15)
1261
Matched order ?
NO
A
YES
"Matched Order Confirmation" (650)

Fig. 11

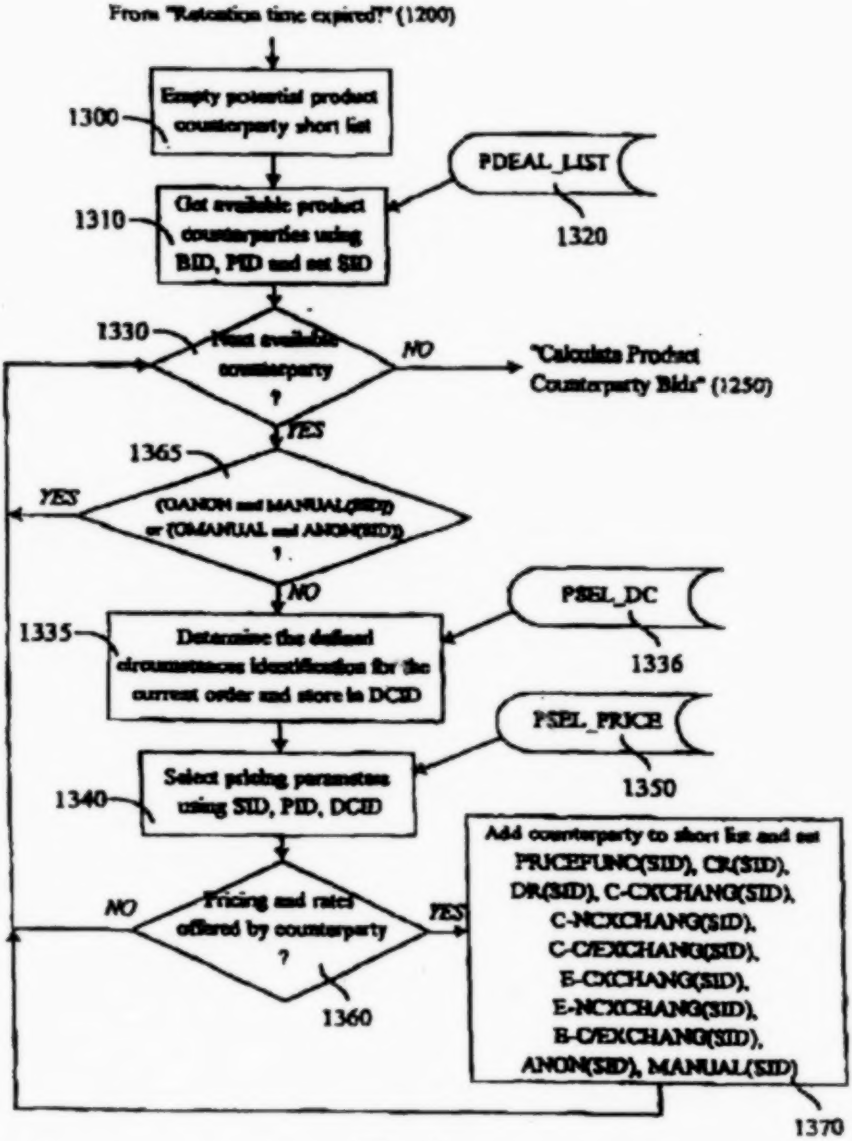

From "Retention time expired?" (1200)
1300
Empty potential product counterparty short list
PDEAL_LIST
1320
1310
Get available product counterparties using BID, PID and set SID
1330
Next available counterparty ?
NO
"Calculate Product Counterparty Bids" (1250)
YES
1365
YES
(OANON and MANUAL(SID)) or (OMANUAL and ANON(SID)) ?
NO
PSEL_DC
1336
1335
Determine the defined circumstances identification for the current order and store in DCID
PSEL_PRICE
1350
Select pricing parameters using SID, PID, DCID
1340
Add counterparty to short list and set PRICEFUNC(SID), CR(SID), DR(SID), C-CXCHANG(SID), C-NCXCHANG(SID), C-C/EXCHANG(SID), E-CXCHANG(SID), E-NCXCHANG(SID), E-C/EXCHANG(SID), ANON(SID), MANUAL(SID)
NO
Pricing and rates offered by counterparty ?
YES
1360
1370

Fig. 12

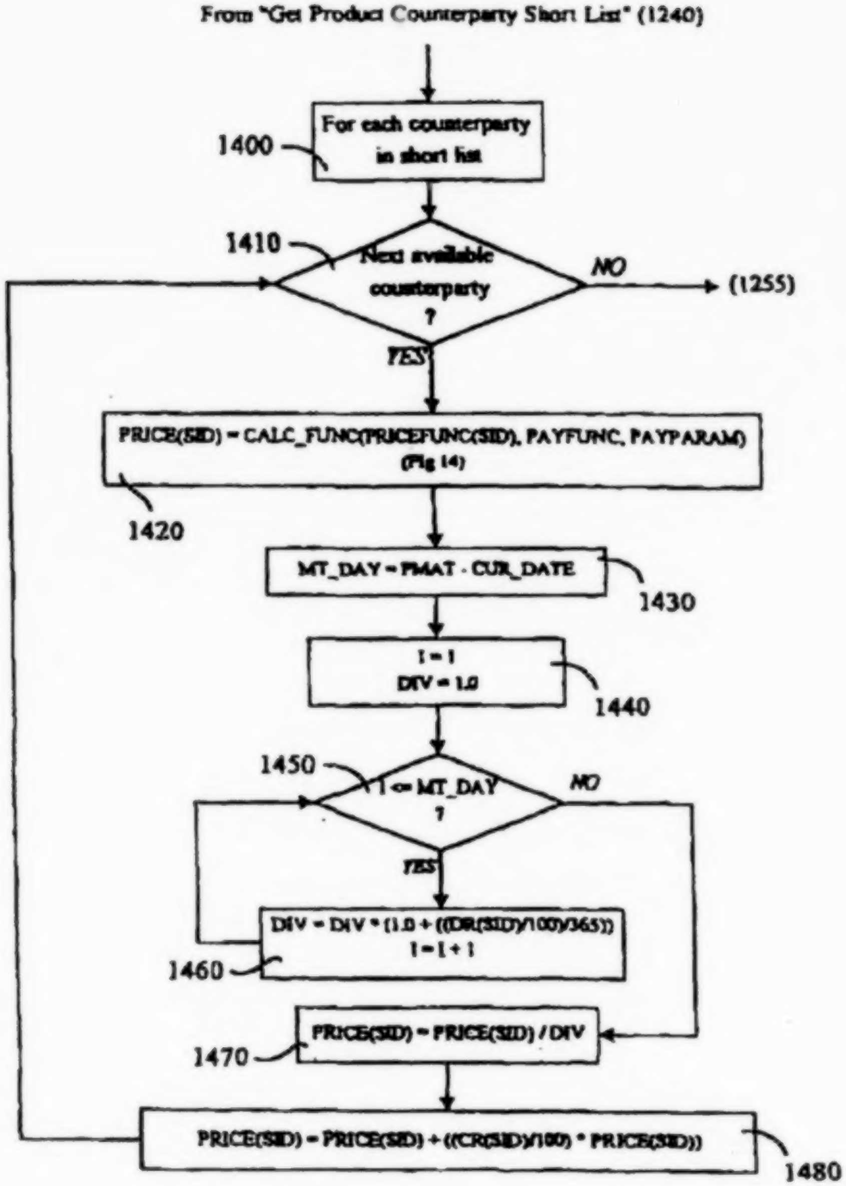

From "Get Product Counterparty Short List" (1240)
For each counterparty in short list
1400
1410
Next available counterparty ?
NO
(1255)
YES
PRICE(SID) = CALC_FUNC(PRICEFUNC(SID), PAYFUNC, PAYPARAM) (Fig 14)
1420
MT_DAY = PMAT - CUR_DATE
1430
I = 1
DIV = 1.0
1440
1450
I <= MT_DAY ?
NO
YES
DIV = DIV * (1.0 + ((DR(SID)/100)/365))
I = I + 1
1460
PRICE(SID) = PRICE(SID) / DIV
1470
PRICE(SID) = PRICE(SID) + ((CR(SID)/100) * PRICE(SID))
1480

Fig. 13

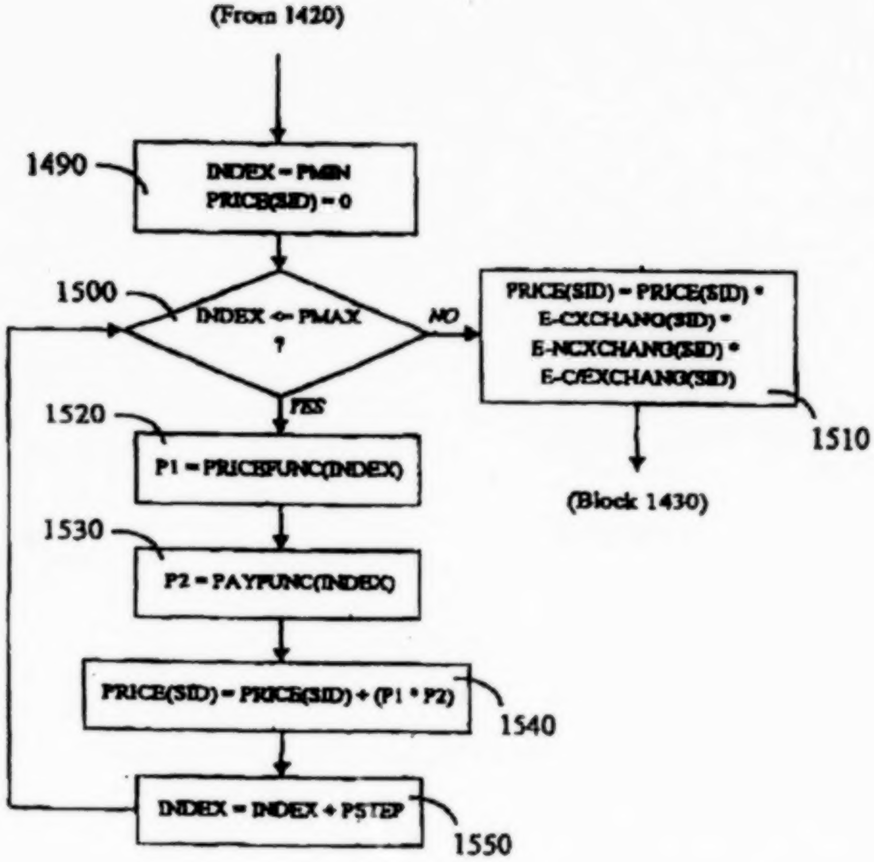

(From 1420)
1490
INDEX = PMIN
PRICE(SID) = 0
1500
INDEX <= PMAX ?
NO
PRICE(SID) = PRICE(SID) * E-CXCHANG(SID) * E-NCXCHANG(SID) * E-C/EXCHANG(SID)
1510
(Block 1430)
YES
1520
P1 = PRICEFUNC(INDEX)
1530
P2 = PAYFUNC(INDEX)
PRICE(SID) = PRICE(SID) + (P1 * P2)
1540
INDEX = INDEX + PSTEP
1550

Fig. 14

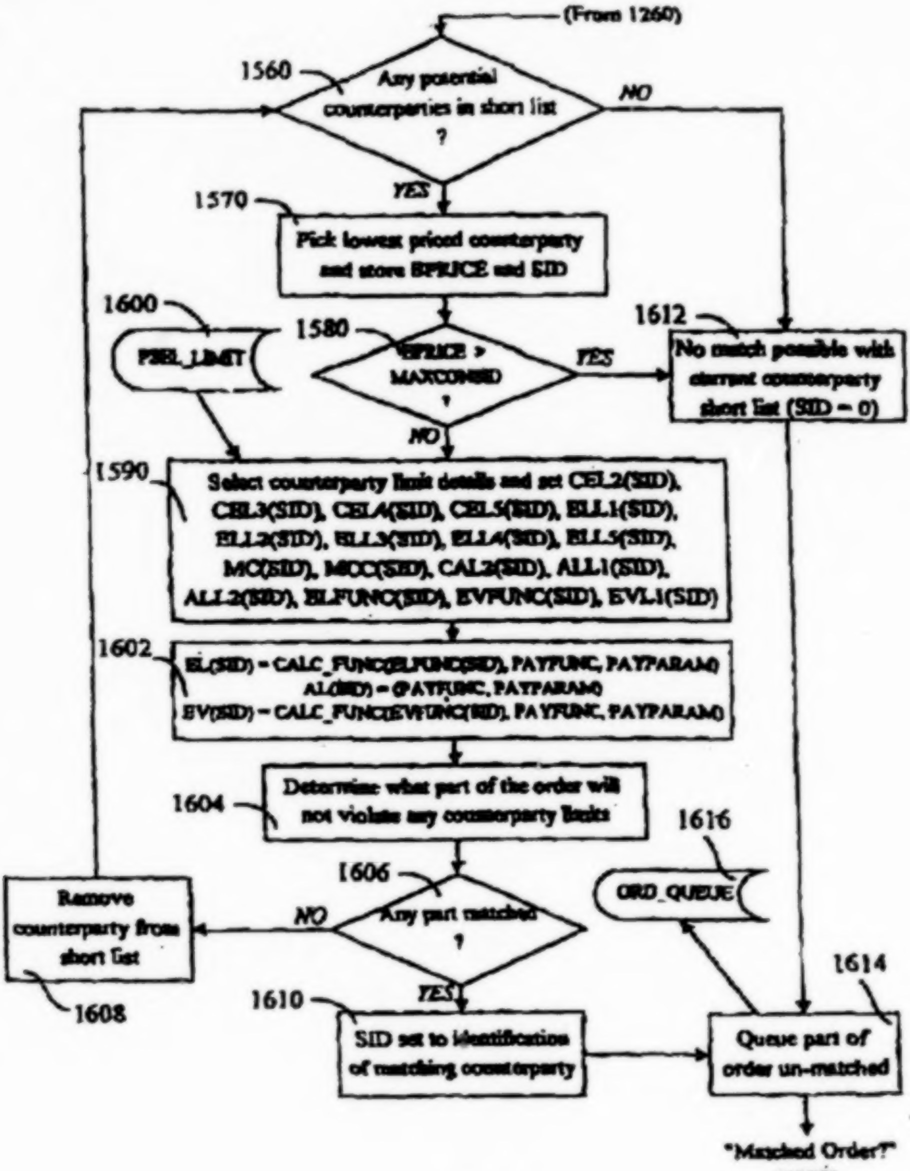

(From 1260)
1560
Any potential counterparties in short list ?
NO
YES
1570
Pick lowest priced counterparty and store BPRICE and SID
1600
PSEL_LIMIT
1580
BPRICE > MAXCONSID ?
YES
1612
No match possible with current counterparty short list (SID = 0)
NO
1590
Select counterparty limit details and set CEL2(SID), CEL3(SID), CEL4(SID), CEL5(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), MC(SID), MCC(SID), CAL2(SID), ALL1(SID), ALL2(SID), ELFUNC(SID), EVFUNC(SID), EVL1(SID)
1602
EL(SID) = CALC_FUNC(ELFUNC(SID), PAYFUNC, PAYPARAM)
AL(SID) = (PAYFUNC, PAYPARAM)
EV(SID) = CALC_FUNC(EVFUNC(SID), PAYFUNC, PAYPARAM)
1604
Determine what part of the order will not violate any counterparty limits
1616
ORD_QUEUE
1606
Any part matched ?
NO
Remove counterparty from short list
1608
YES
1610
SID set to identification of matching counterparty
1614
Queue part of order un-matched
"Matched Order?" (1228)

Fig. 15

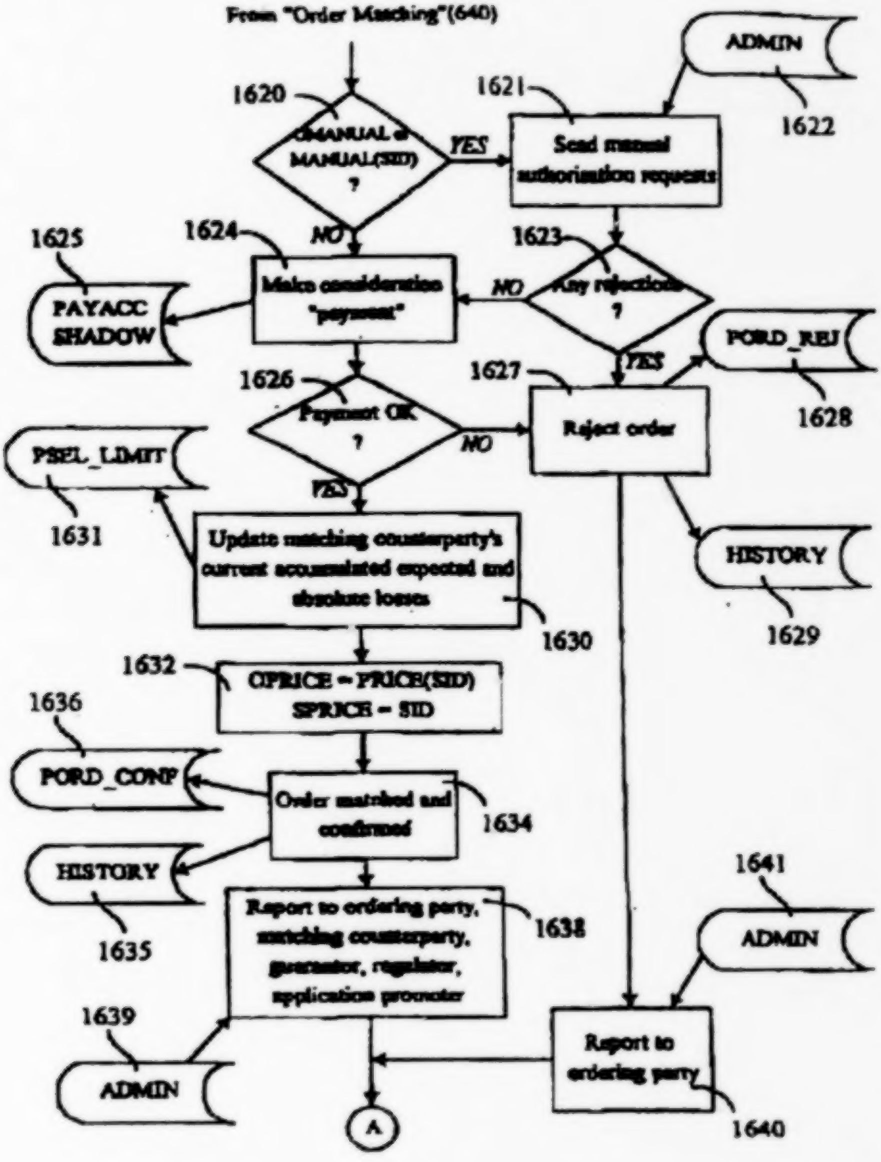

From "Order Matching"(640)
1620
OMANUAL or MANUAL(SID) ?
YES
NO
1621
Send manual authorisation requests
ADMIN
1622
1623
Any rejections ?
NO
YES
1624
Make consideration "payment"
1625
PAYACC SHADOW
1626
Payment OK ?
NO
YES
1627
Reject order
PORD_REJ
1628
HISTORY
1629
PSEL_LIMIT
1631
Update matching counterparty's current accumulated expected and absolute losses
1630
1632
OPRICE = PRICE(SID)
SPRICE = SID
1636
PORD_CONF
Order matched and confirmed
1634
HISTORY
1635
Report to ordering party, matching counterparty, guarantor, regulator, application promoter
1638
1639
ADMIN
1641
ADMIN
Report to ordering party
1640
A

Fig. 16

EXAMPLE III

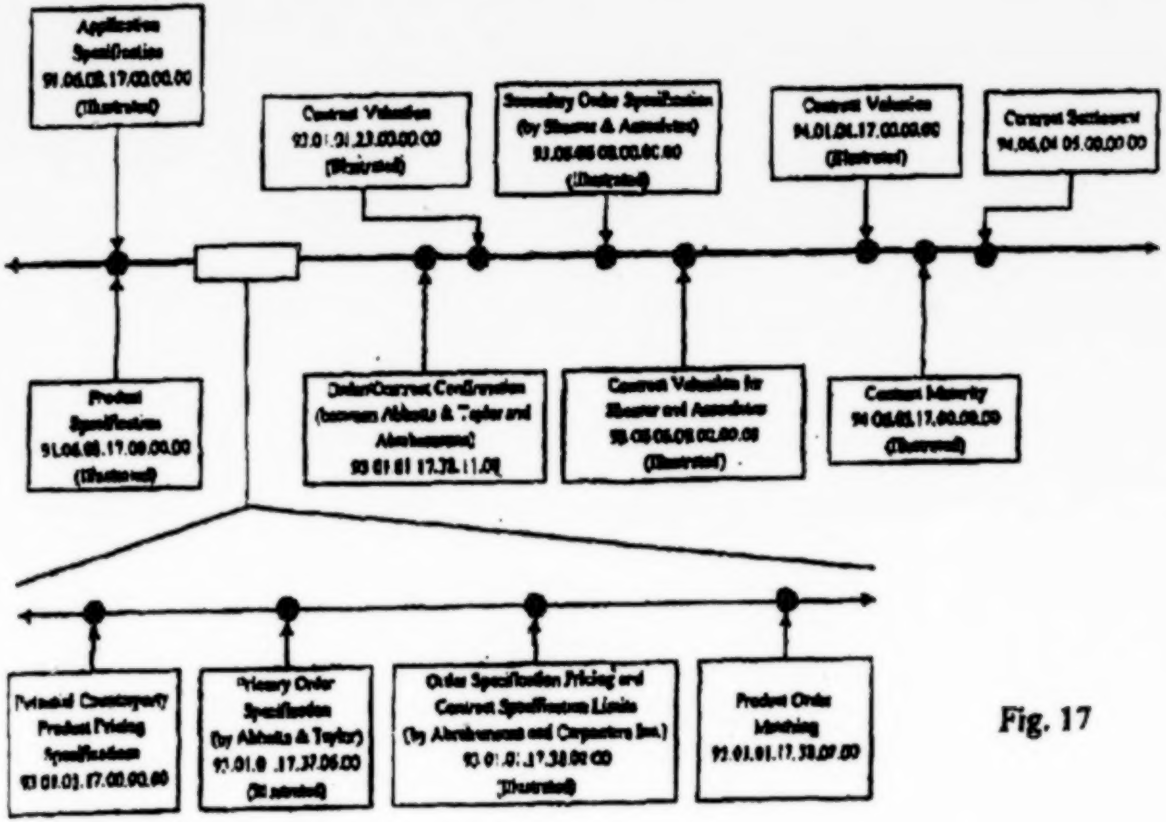

Application Specification 91.06.08.17.00.00.00 (Illustrated)
Product Specification 91.06.08.17.00.00.00 (Illustrated)
Contract Valuation 93.01.31.23.00.00.00 (Illustrated)
Order/Contract Confirmation (between Abbotts & Taylor and Abrahamsons) 93.01.01.17.38.11.00
Secondary Order Specification (by Sharma & Associates) 93.08.08.08.00.00.00 (Illustrated)
Contract Valuation for Sharma and Associates 93.08.08.08.00.00.00 (Illustrated)
Contract Valuation 94.01.01.17.00.00.00 (Illustrated)
Contract Maturity 94.06.08.17.00.00.00 (Illustrated)
Contract Settlement 94.06.04.05.00.00.00
Potential Counterparty Product Pricing Specification 93.01.01.17.00.00.00
Primary Order Specification (by Abbotts & Taylor) 93.01.01.17.37.06.00 (Illustrated)
Order Specification Pricing and Contract Specification Limits (by Abrahamsons and Carpenters Inc.) 93.01.01.17.38.00.00 (Illustrated)
Product Order Matching 93.01.01.17.38.07.00

Fig. 17

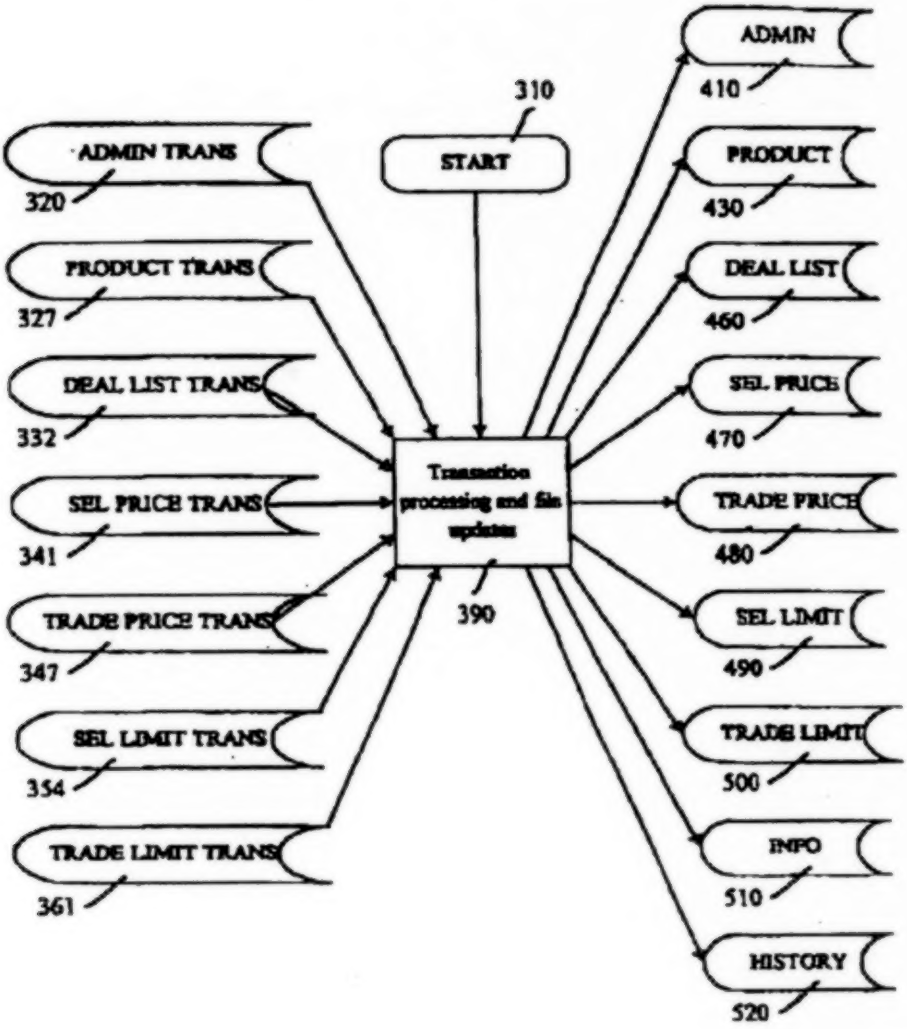

310
START
ADMIN TRANS
320
PRODUCT TRANS
327
DEAL LIST TRANS
332
SEL PRICE TRANS
341
TRADE PRICE TRANS
347
SEL LIMIT TRANS
354
TRADE LIMIT TRANS
361
Transaction processing and file updates
390
ADMIN
410
PRODUCT
430
DEAL LIST
460
SEL PRICE
470
TRADE PRICE
480
SEL LIMIT
490
TRADE LIMIT
500
INFO
510
HISTORY
520

Fig. 18

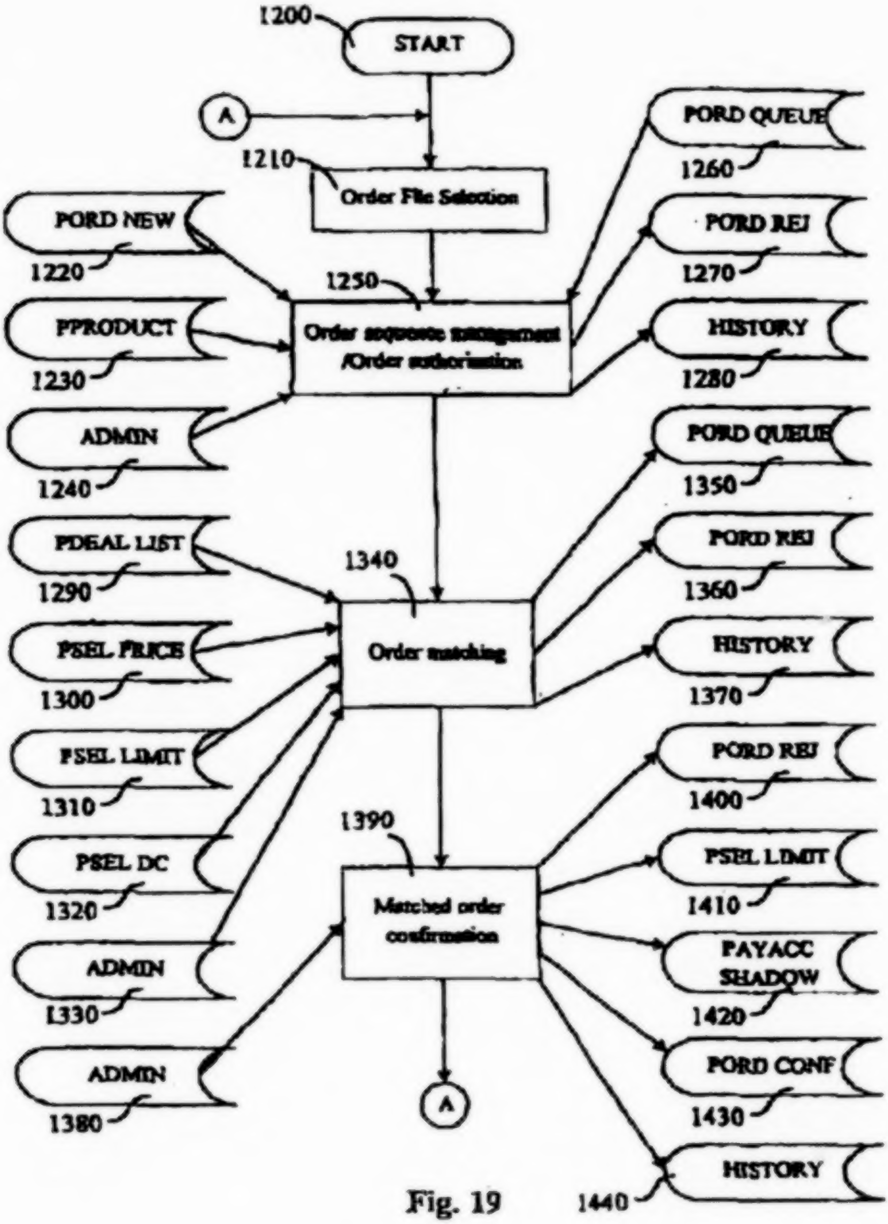

1200
START
A
1210
Order File Selection
PORD NEW
1220
PPRODUCT
1230
ADMIN
1240
1250
Order sequence management /Order authorization
PORD QUEUE
1260
PORD REJ
1270
HISTORY
1280
PDEAL LIST
1290
PSEL PRICE
1300
PSEL LIMIT
1310
PSEL DC
1320
ADMIN
1330
1340
Order matching
PORD QUEUE
1350
PORD REJ
1360
HISTORY
1370
ADMIN
1380
1390
Matched order confirmation
PORD REJ
1400
PSEL LIMIT
1410
PAYACC SHADOW
1420
PORD CONF
1430
HISTORY
1440
A

Fig. 19

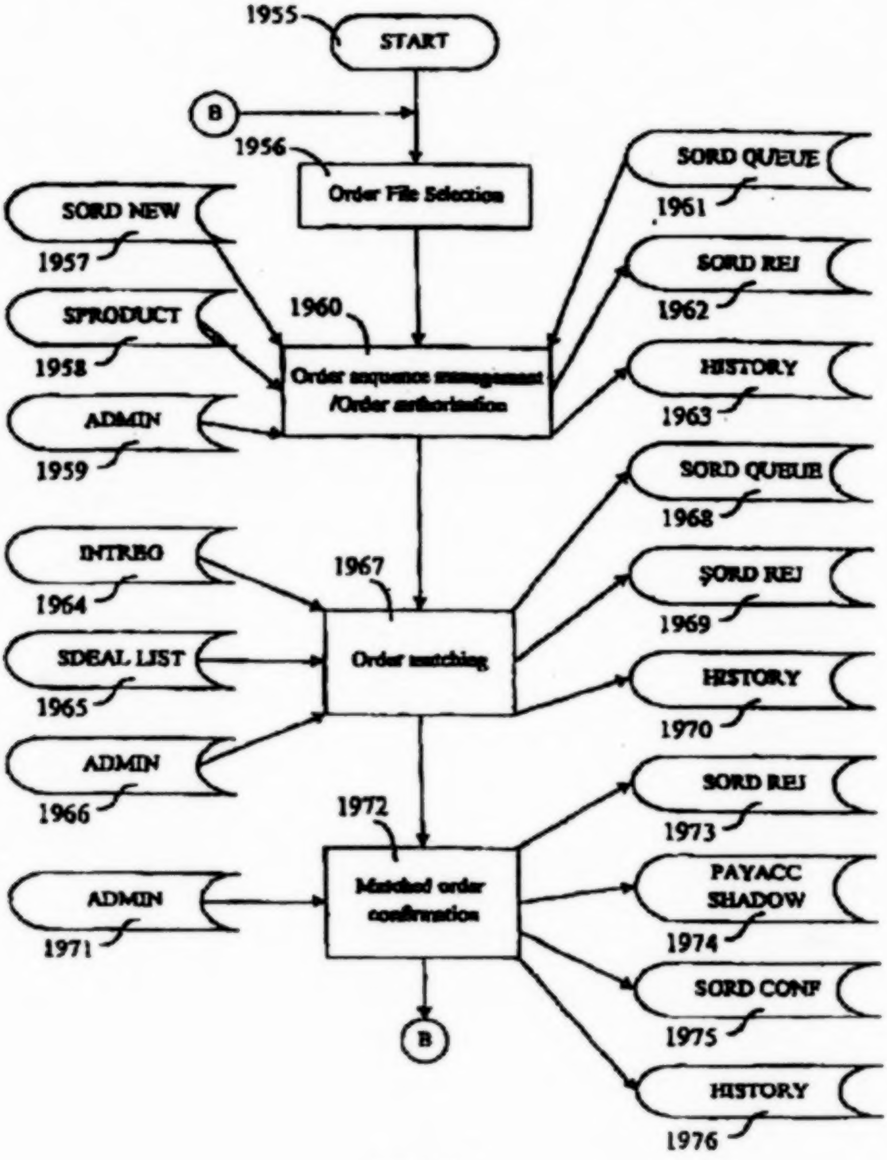

1955
START
B
1956
Order File Selection
SORD NEW
1957
SPRODUCT
1958
ADMIN
1959
1960
Order sequence management
/Order authorization
SORD QUEUE
1961
SORD REJ
1962
HISTORY
1963
INTREG
1964
SDEAL LIST
1965
ADMIN
1966
1967
Order matching
SORD QUEUE
1968
SORD REJ
1969
HISTORY
1970
ADMIN
1971
1972
Matched order
confirmation
SORD REJ
1973
PAYACC
SHADOW
1974
SORD CONF
1975
HISTORY
1976
B

Fig. 20

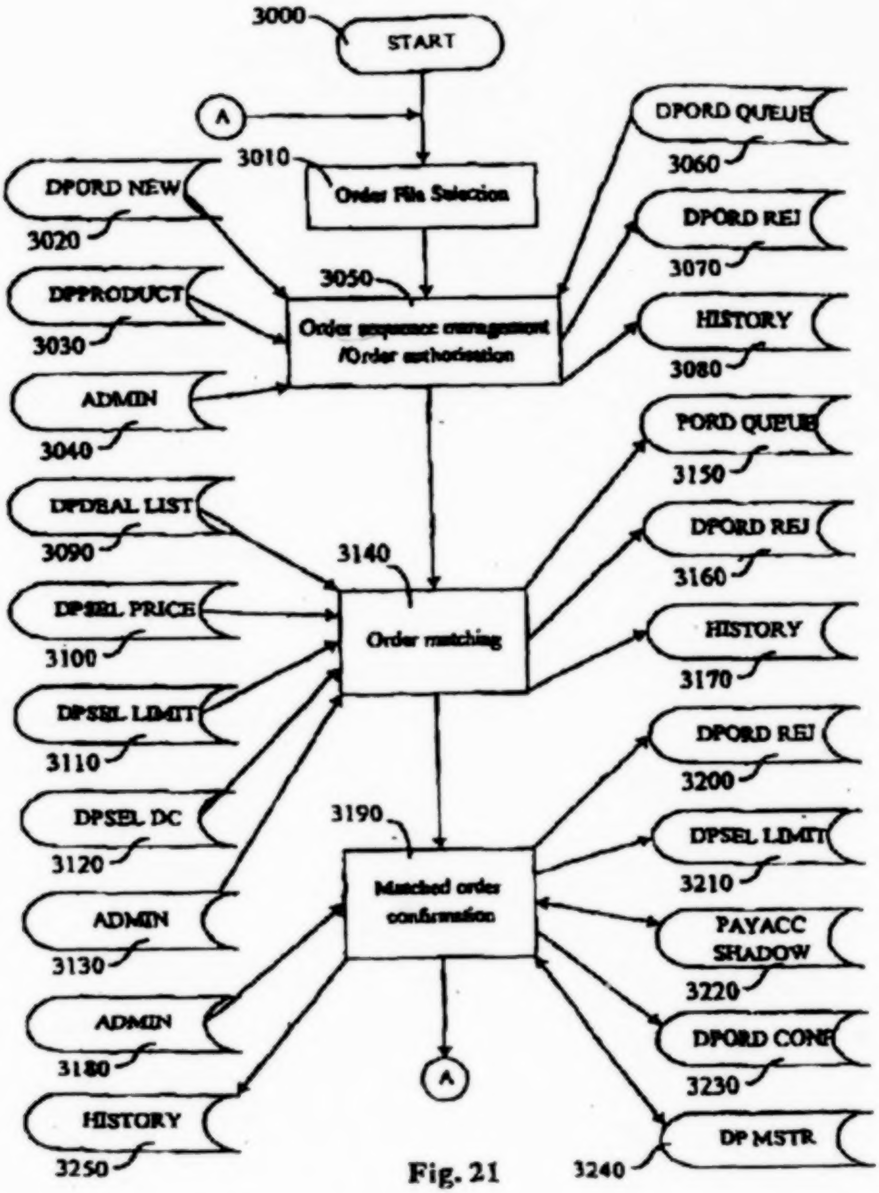

3000
START
A
3010
Order File Selection
DPORD NEW
3020
DPPRODUCT
3030
ADMIN
3040
3050
Order sequence management /Order authorisation
DPORD QUEUE
3060
DPORD REJ
3070
HISTORY
3080
DPDBAL LIST
3090
DPSEL PRICE
3100
DPSEL LIMIT
3110
DPSEL DC
3120
ADMIN
3130
3140
Order matching
PORD QUEUE
3150
DPORD REJ
3160
HISTORY
3170
3190
Matched order confirmation
ADMIN
3180
HISTORY
3250
A
DPORD REJ
3200
DPSEL LIMIT
3210
PAYACC SHADOW
3220
DPORD CONF
3230
DP MSTR
3240

Fig. 21

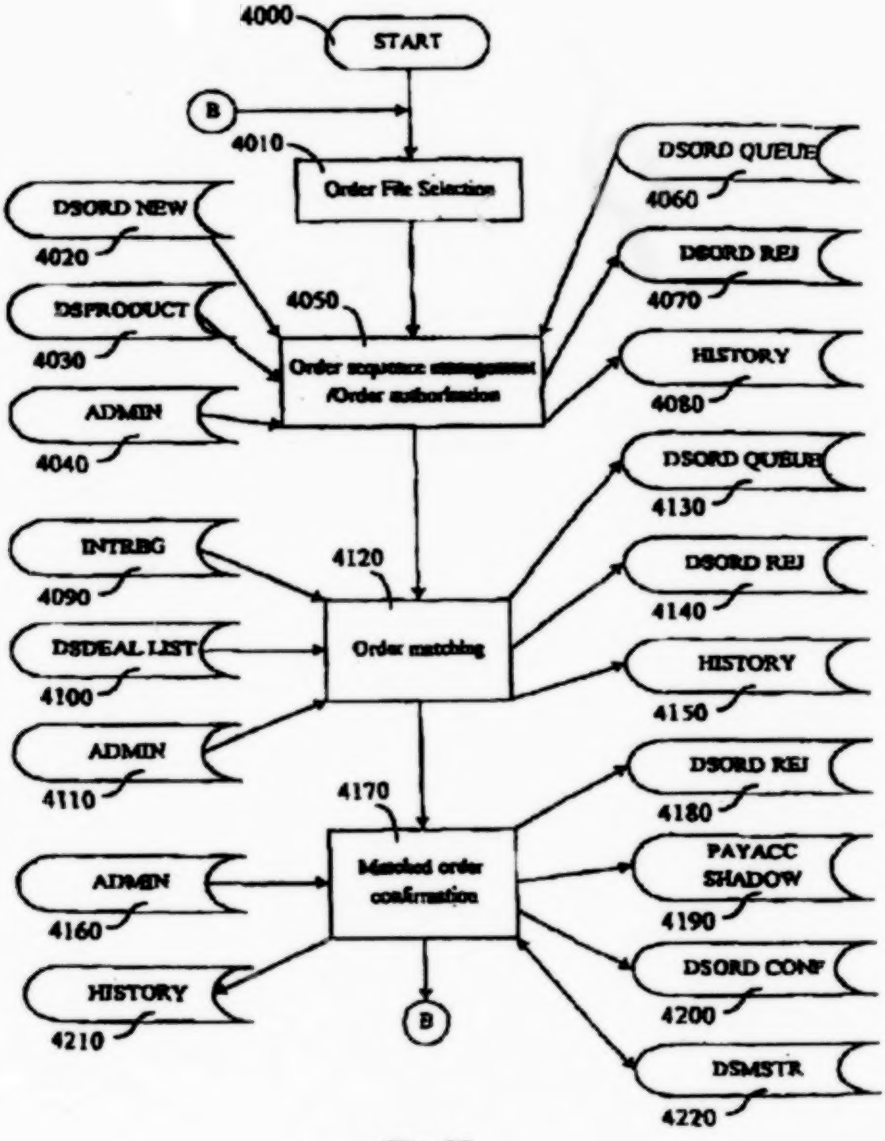

4000
START
B
4010
Order File Selection
DSORD NEW
4020
DSPRODUCT
4030
ADMIN
4040
4050
Order sequence management /Order authorization
DSORD QUEUE
4060
DSORD REJ
4070
HISTORY
4080
INTREG
4090
DSDEAL LIST
4100
ADMIN
4110
4120
Order matching
DSORD QUEUE
4130
DSORD REJ
4140
HISTORY
4150
ADMIN
4160
4170
Matched order confirmation
DSORD REJ
4180
PAYACC SHADOW
4190
DSORD CONF
4200
HISTORY
4210
B
DSMSTR
4220

Fig. 22

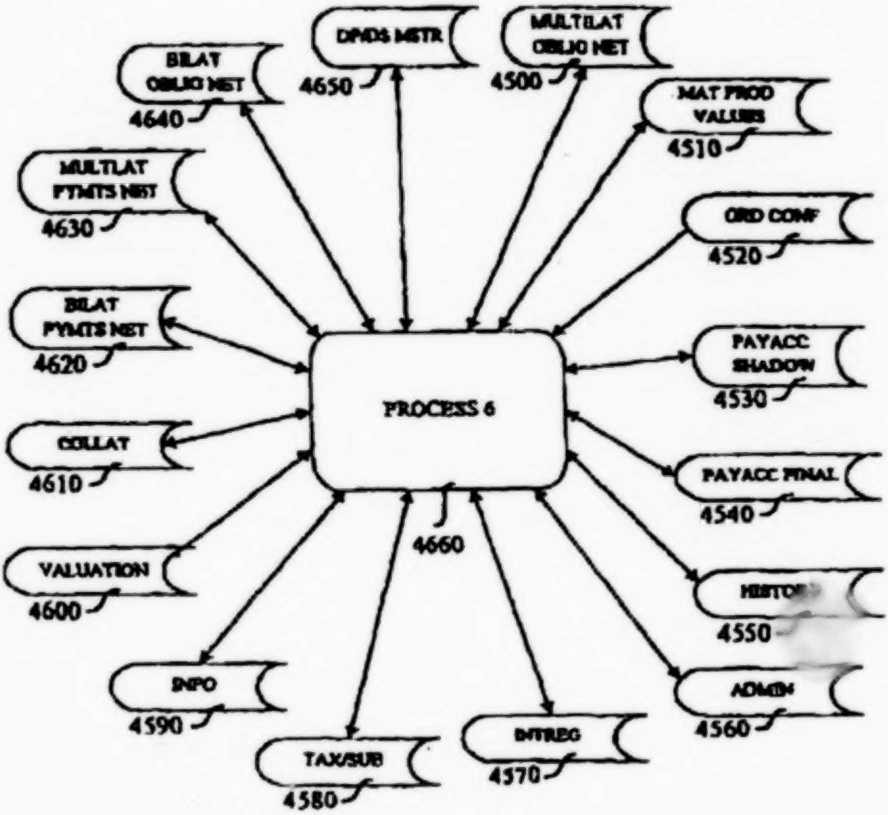

BILAT OBLIG NET
4640
DPNDS MSTR
4650
MULTILAT OBLIG NET
4500
MAT PROD VALUES
4510
MULTLAT PYMTS NET
4630
ORD CONF
4520
BILAT PYMTS NET
4620
PAYACC SHADOW
4530
PROCESS 6
COLLAT
4610
PAYACC FINAL
4540
4660
VALUATION
4600
HISTORY
4550
INFO
4590
ADMIN
4560
TAX/SUB
4580
INTREG
4570

Fig. 23

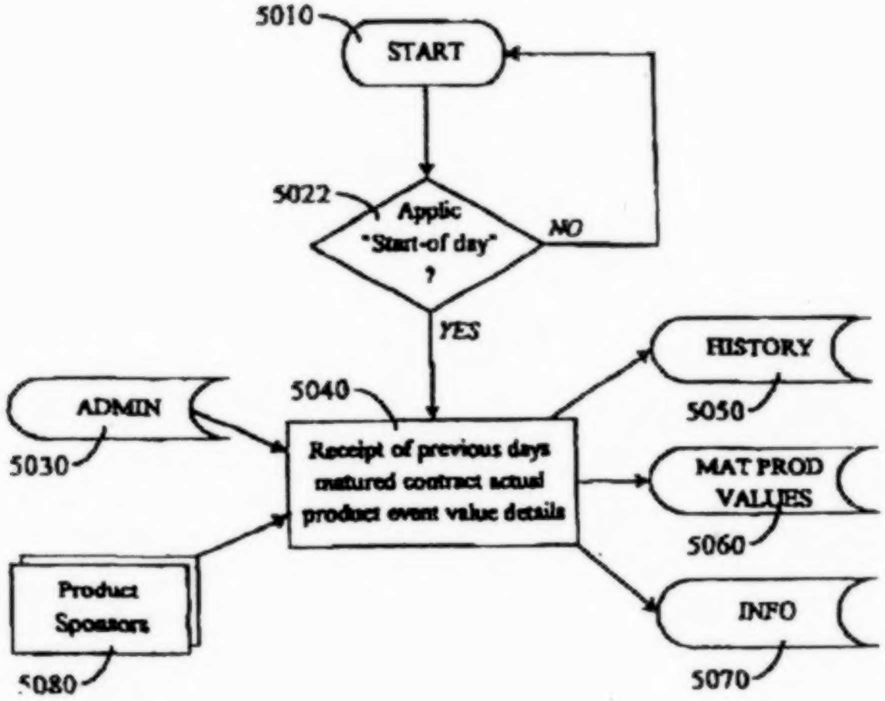

5010
START
5022
Applic
"Start-of day"
?
NO
YES
5040
Receipt of previous days matured contract actual product event value details
ADMIN
5030
Product
Sponsors
5080
HISTORY
5050
MAT PROD
VALUES
5060
INFO
5070

Fig. 24

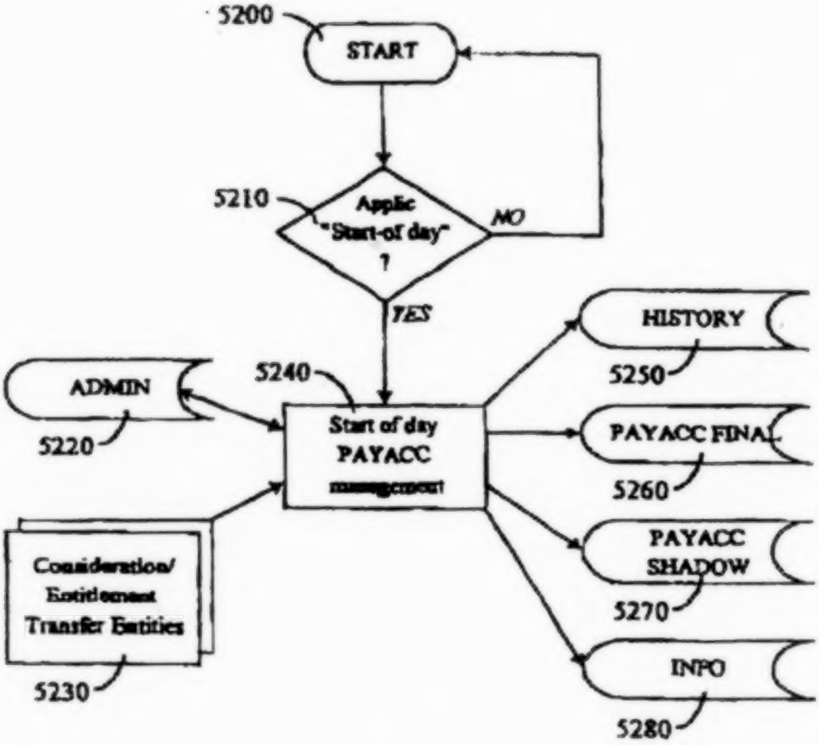

5200
START
5210
Applic "Start-of day" ?
NO
YES
5240
Start of day PAYACC management
ADMIN
5220
Consideration/ Entitlement Transfer Entities
5230
HISTORY
5250
PAYACC FINAL
5260
PAYACC SHADOW
5270
INFO
5280

Fig. 25

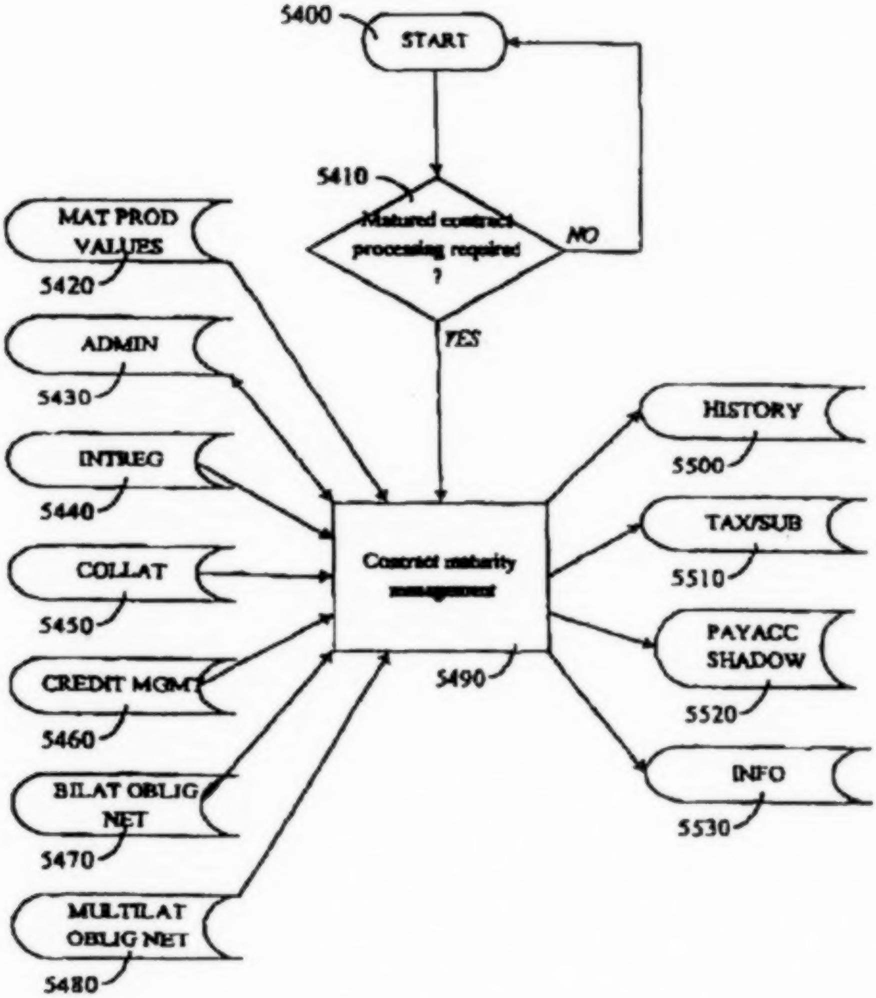

5400
START
5410
Matured contract processing required ?
NO
YES
MAT PROD VALUES
5420
ADMIN
5430
INTREG
5440
COLLAT
5450
CREDIT MGMT
5460
BILAT OBLIG NET
5470
MULTILAT OBLIG NET
5480
Contract maturity management
5490
HISTORY
5500
TAX/SUB
5510
PAYACC SHADOW
5520
INFO
5530

Fig. 26

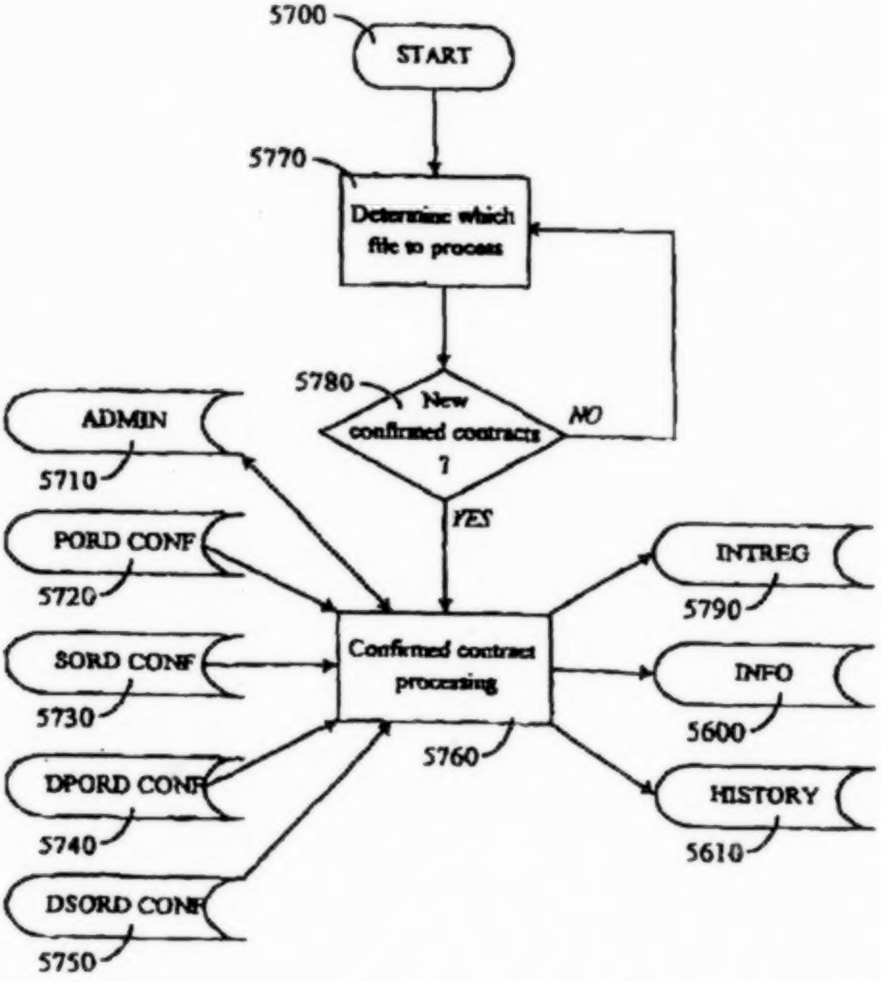
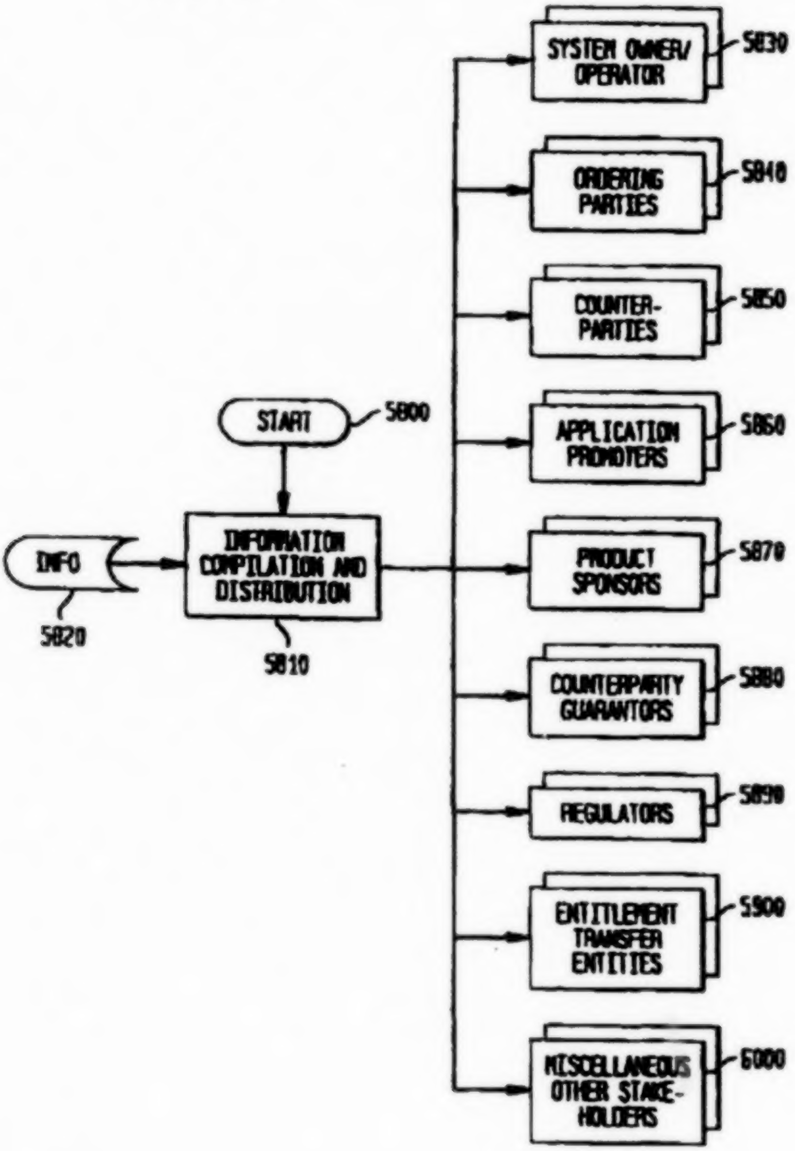

5700
START
5770
Determine which file to process
5780
New confirmed contracts ?
NO
YES
ADMIN
5710
PORD CONF
5720
SORD CONF
5730
DPORD CONF
5740
DSORD CONF
5750
Confirmed contract processing
5760
INTREG
5790
INFO
5600
HISTORY
5610

Fig 27

FIG. 28


START
5800
INFO
5820
INFORMATION COMPILATION AND DISTRIBUTION
5810
SYSTEM OWNER/ OPERATOR
5830
ORDERING PARTIES
5840
COUNTER- PARTIES
5850
APPLICATION PROMOTERS
5860
PRODUCT SPONSORS
5870
COUNTERPARTY GUARANTORS
5880
REGULATORS
5890
ENTITLEMENT TRANSFER ENTITIES
5900
MISCELLANEOUS OTHER STAKE- HOLDERS
6000

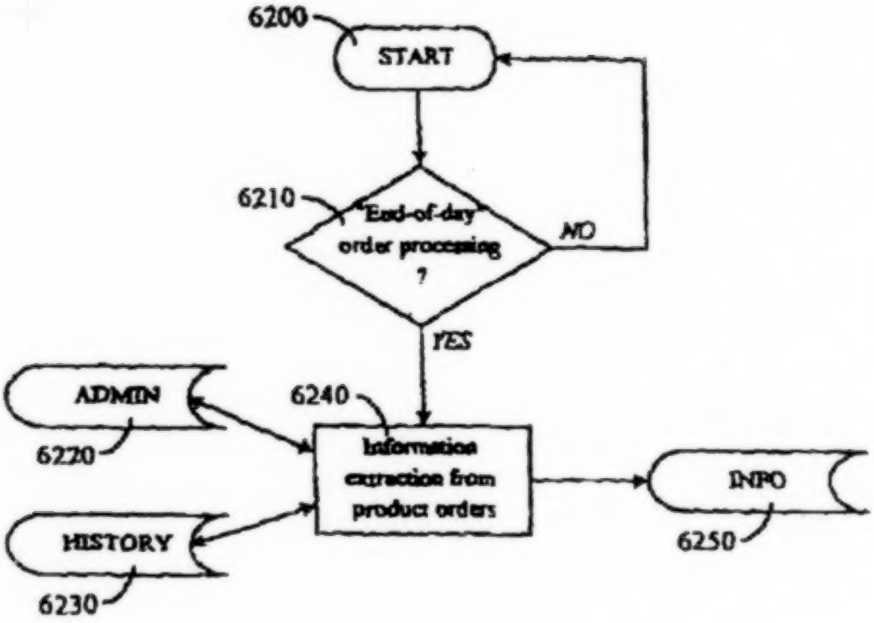

6200
START
6210
"End-of-day" order processing ?
NO
YES
ADMIN
6220
6240
Information extraction from product orders
INFO
6250
HISTORY
6230

Fig. 29

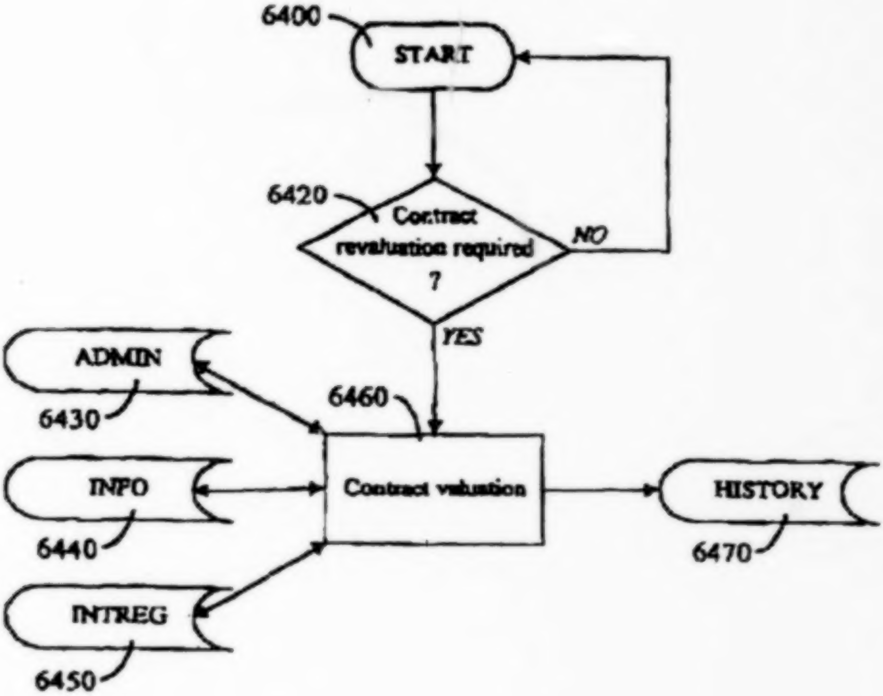

6400
START
6420
Contract revaluation required ?
NO
YES
ADMIN
6430
6460
INFO
Contract valuation
HISTORY
6440
6470
INTREG
6450

Fig. 30

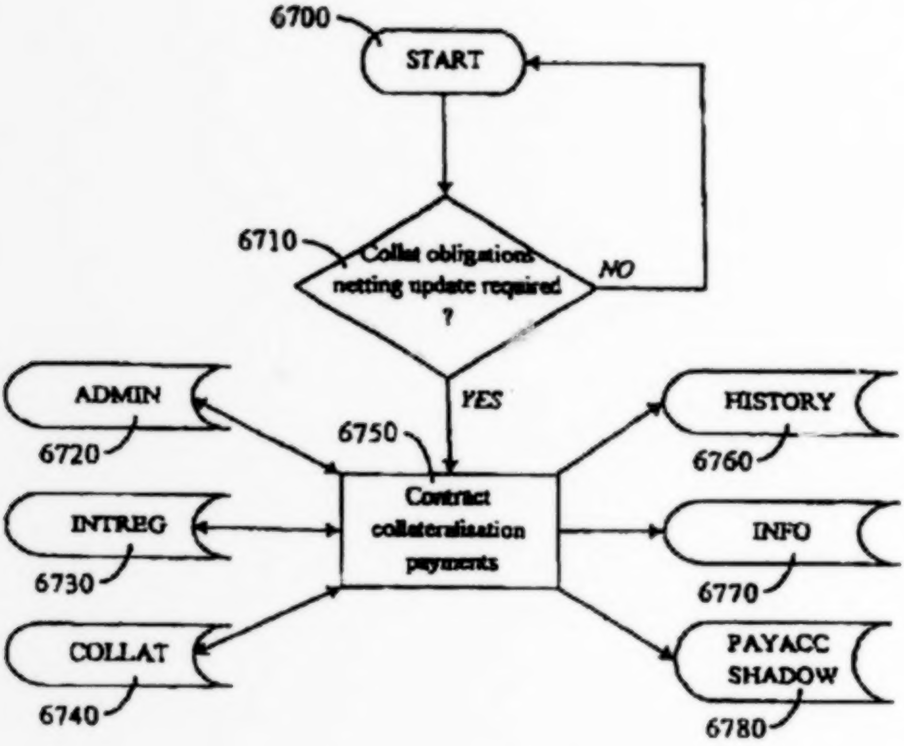

6700
START
6710
Collat obligations netting update required ?
NO
YES
ADMIN
6720
INTREG
6730
COLLAT
6740
6750
Contract collateralisation payments
HISTORY
6760
INFO
6770
PAYACC SHADOW
6780

Fig. 31

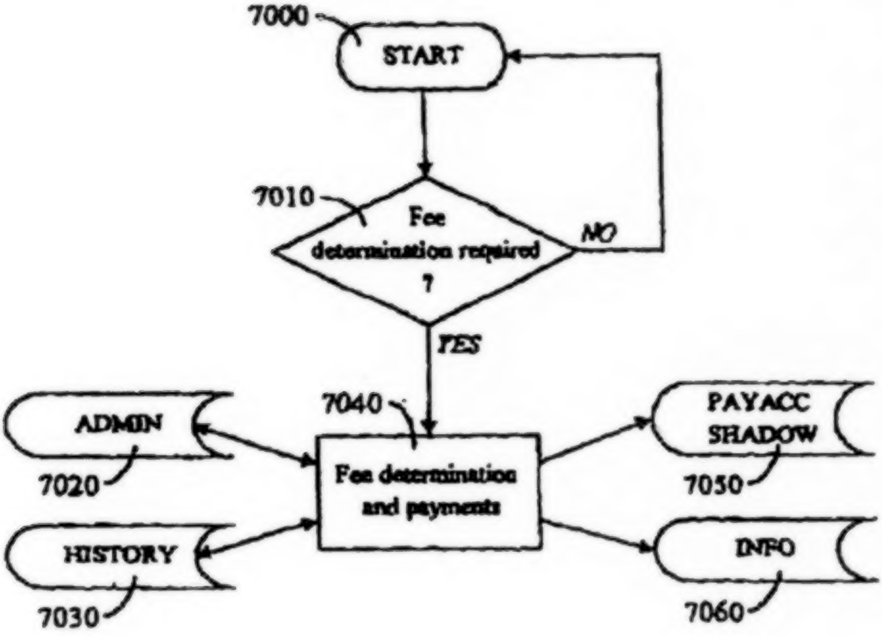

7000
START
7010
Fee determination required ?
NO
YES
7040
ADMIN
7020
HISTORY
7030
Fee determination and payments
PAYACC SHADOW
7050
INFO
7060

Fig. 32

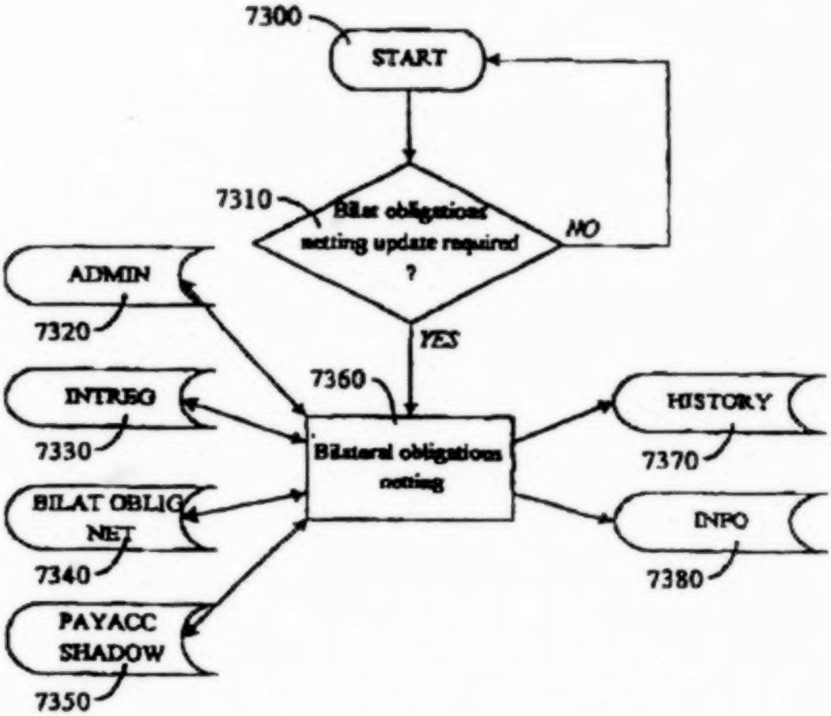

7300
START
7310
Bilat obligations netting update required ?
NO
YES
ADMIN
7320
INTREG
7330
BILAT OBLIG NET
7340
PAYACC SHADOW
7350
7360
Bilateral obligations netting
HISTORY
7370
INFO
7380

Fig. 33

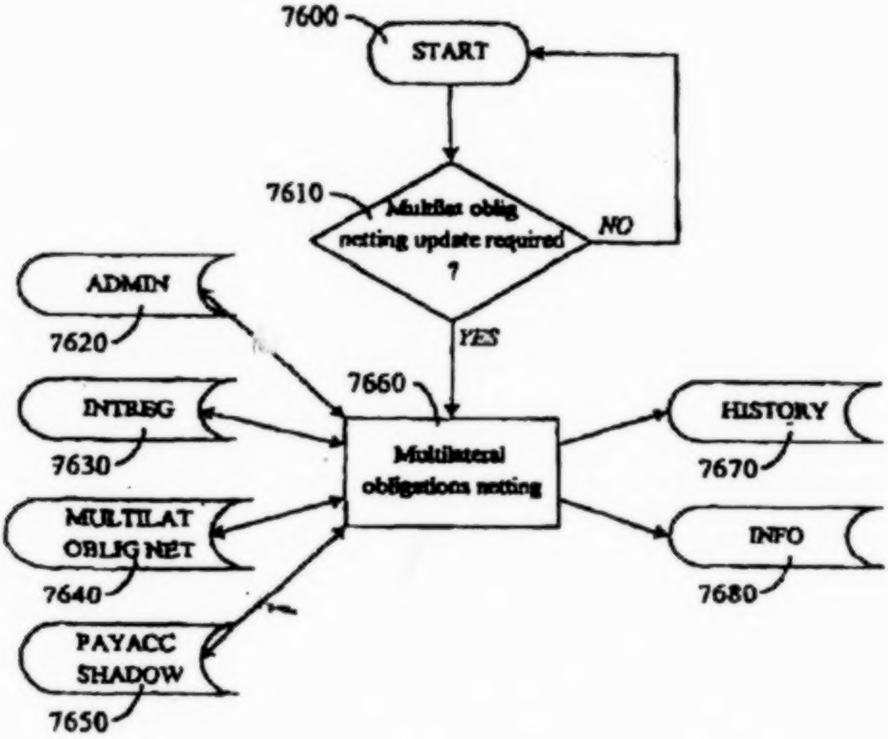

7600
START
7610
Multilat oblig netting update required ?
NO
YES
ADMIN
7620
INTREG
7630
MULTILAT OBLIG NET
7640
PAYACC SHADOW
7650
7660
Multilateral obligations netting
HISTORY
7670
INFO
7680

Fig. 34

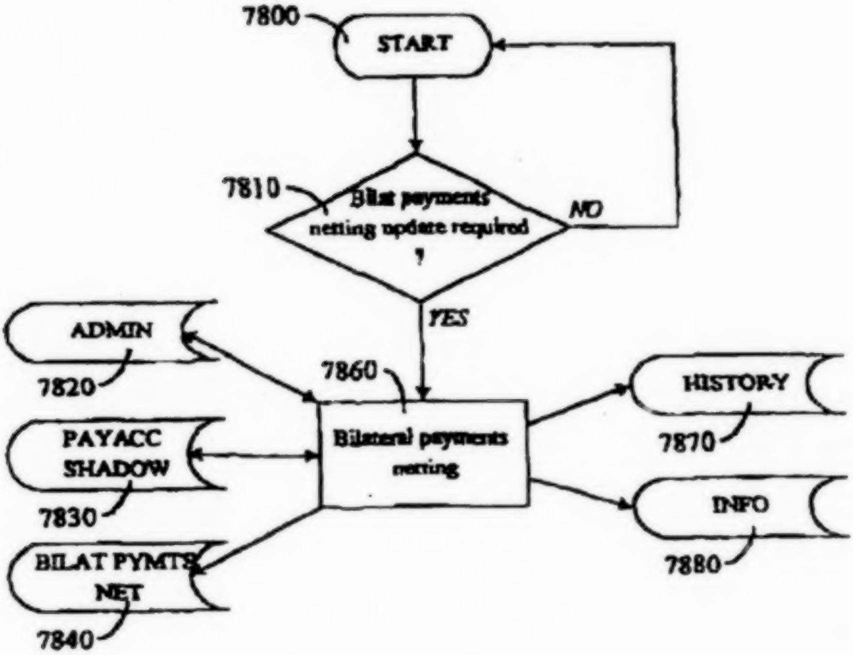

7800
START
7810
Bilat payments netting update required ?
NO
YES
ADMIN
7820
PAYACC SHADOW
7830
BILAT PYMTS NET
7840
7860
Bilateral payments netting
HISTORY
7870
INFO
7880

Fig. 35

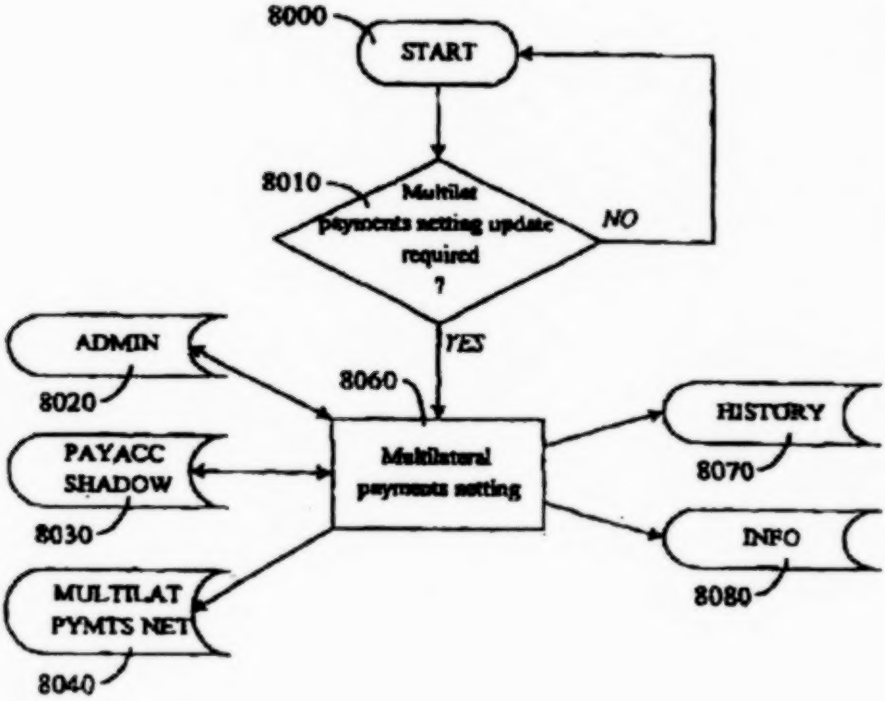

8000
START
8010
Multilat payments netting update required ?
NO
YES
ADMIN
8020
PAYACC SHADOW
8030
MULTILAT PYMTS NET
8040
8060
Multilateral payments netting
HISTORY
8070
INFO
8080

Fig. 36

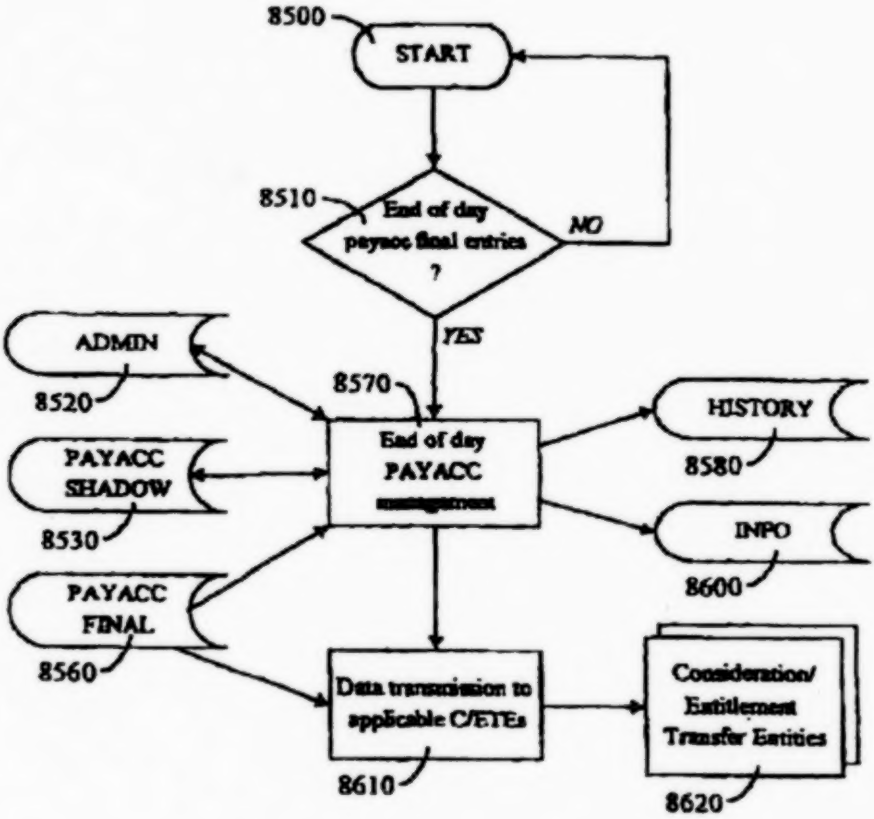

8500
START
8510
End of day
paycc final entries
?
NO
YES
ADMIN
8520
8570
End of day
PAYACC
management
HISTORY
8580
PAYACC
SHADOW
8530
INFO
8600
PAYACC
FINAL
8560
Data transmission to
applicable C/ETEs
8610
Consideration/
Entitlement
Transfer Entities
8620

Fig. 37

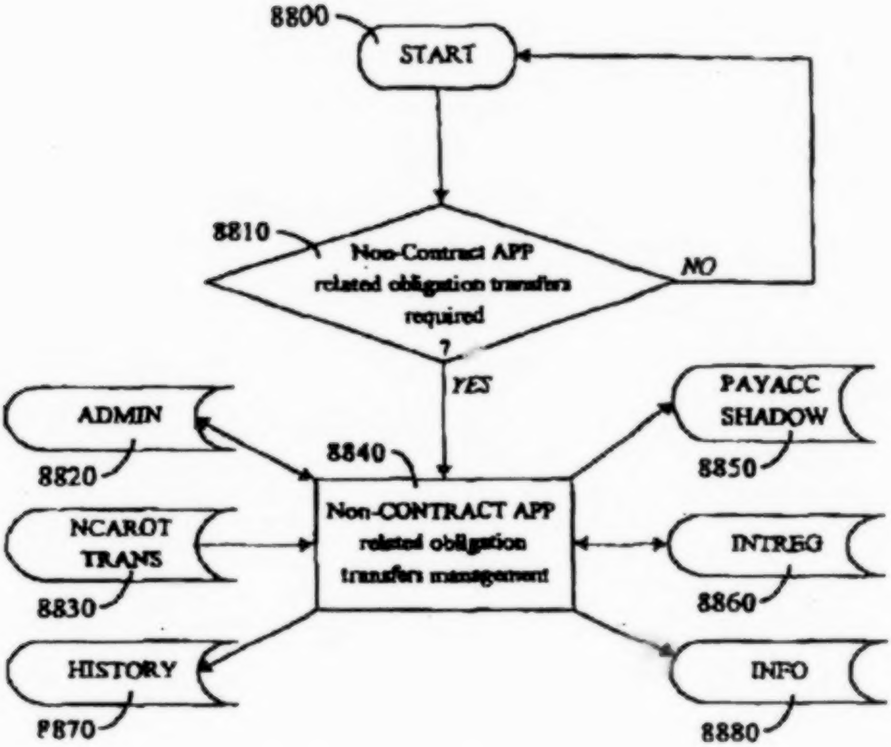

8800
START
8810
Non-Contract APP related obligation transfers required ?
NO
YES
ADMIN
8820
NCAROT TRANS
8830
HISTORY
8870
8840
Non-CONTRACT APP related obligation transfers management
PAYACC SHADOW
8850
INTREG
8860
INFO
8880

Fig. 38

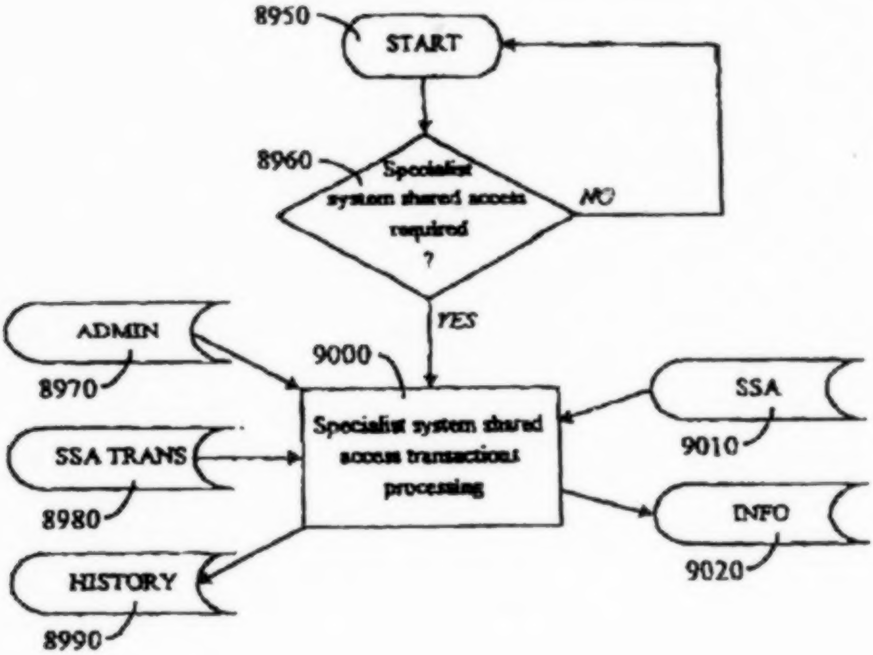

8950
START
8960
Specialist system shared access required ?
NO
YES
ADMIN
8970
9000
Specialist system shared access transactions processing
SSA
9010
SSA TRANS
8980
INFO
9020
HISTORY
8990

Fig. 39

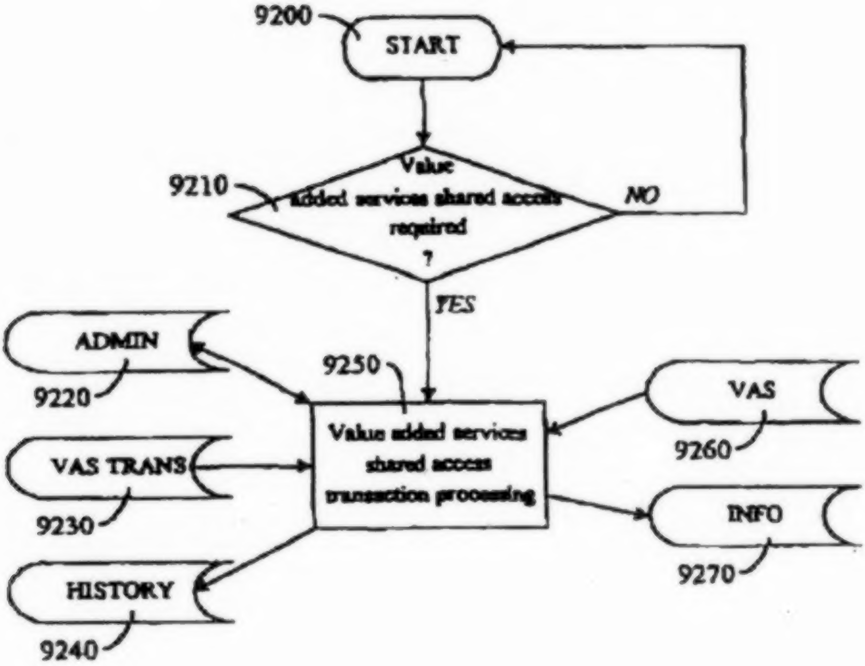

9200
START
9210
Value added services shared access required ?
NO
YES
ADMIN
9220
VAS TRANS
9230
HISTORY
9240
9250
Value added services shared access transaction processing
VAS
9260
INFO
9270

Fig. 40

EXAMPLE IV

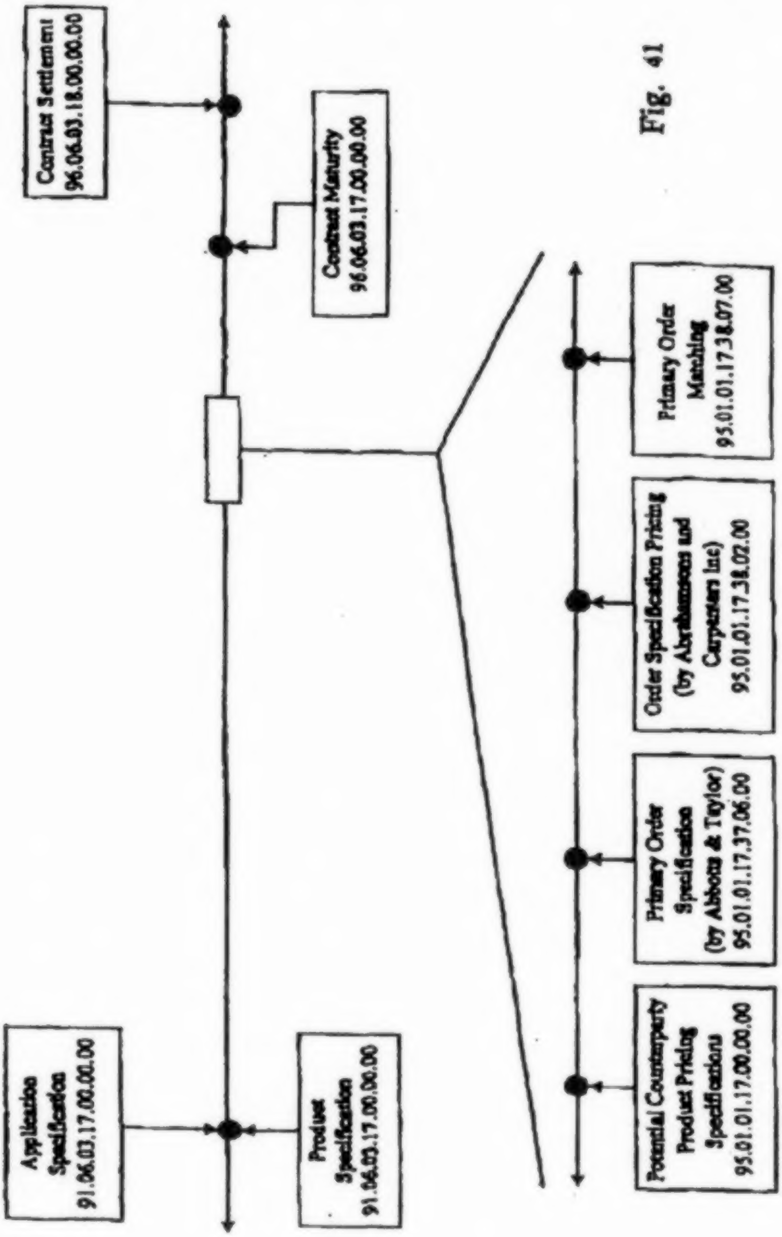

Application Specification 91.06.03.17.00.00.00
Product Specification 91.06.03.17.00.00.00
Contract Maturity 96.06.03.17.00.00.00
Contract Settlement 96.06.03.18.00.00.00
Potential Counterparty Product Pricing Specifications 95.01.01.17.00.00.00
Primary Order Specification (by Abbotts & Taylor) 95.01.01.17.37.06.00
Order Specification Pricing (by Abrahamsons and Carpenters Inc) 95.01.01.17.38.02.00
Primary Order Matching 95.01.01.17.38.07.00

Fig. 41

EXAMPLE V

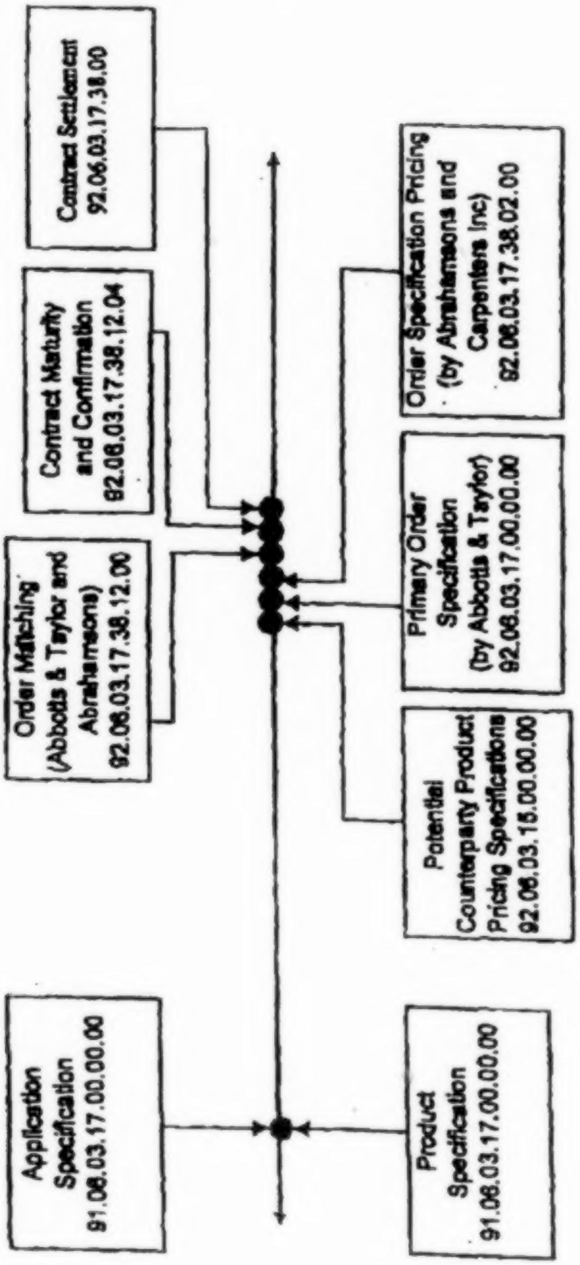
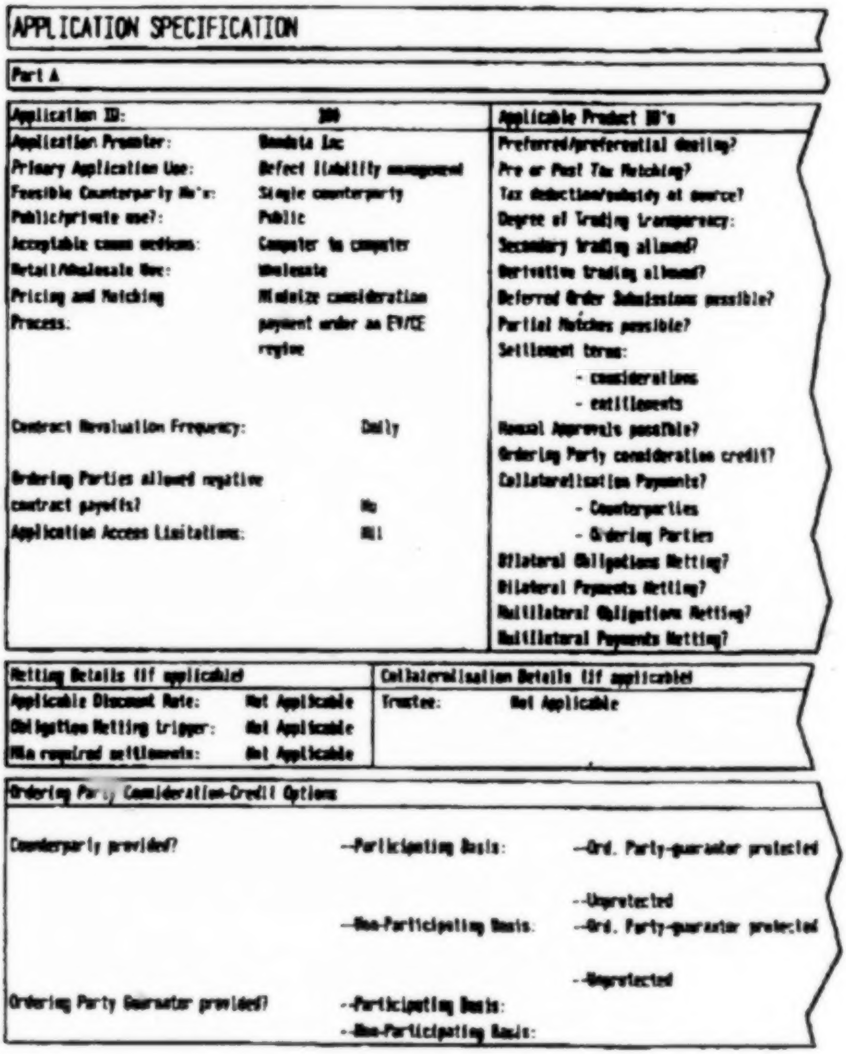

Application Specification 91.08.03.17.00.00.00
Product Specification 91.08.03.17.00.00.00
Order Matching (Abbotts & Taylor and Abrahamsons) 92.08.03.17.38.12.00
Potential Counterparty Product Pricing Specifications 92.08.03.15.00.00.00
Primary Order Specification (by Abbotts & Taylor) 92.08.03.17.00.00.00
Contract Maturity and Confirmation 92.08.03.17.38.12.04
Order Specification Pricing (by Abrahamsons and Carpenters Inc) 92.08.03.17.38.02.00
Contract Settlement 92.08.03.17.38.00

Fig. 42

FIG. 43A



APPLICATION SPECIFICATION

Part A

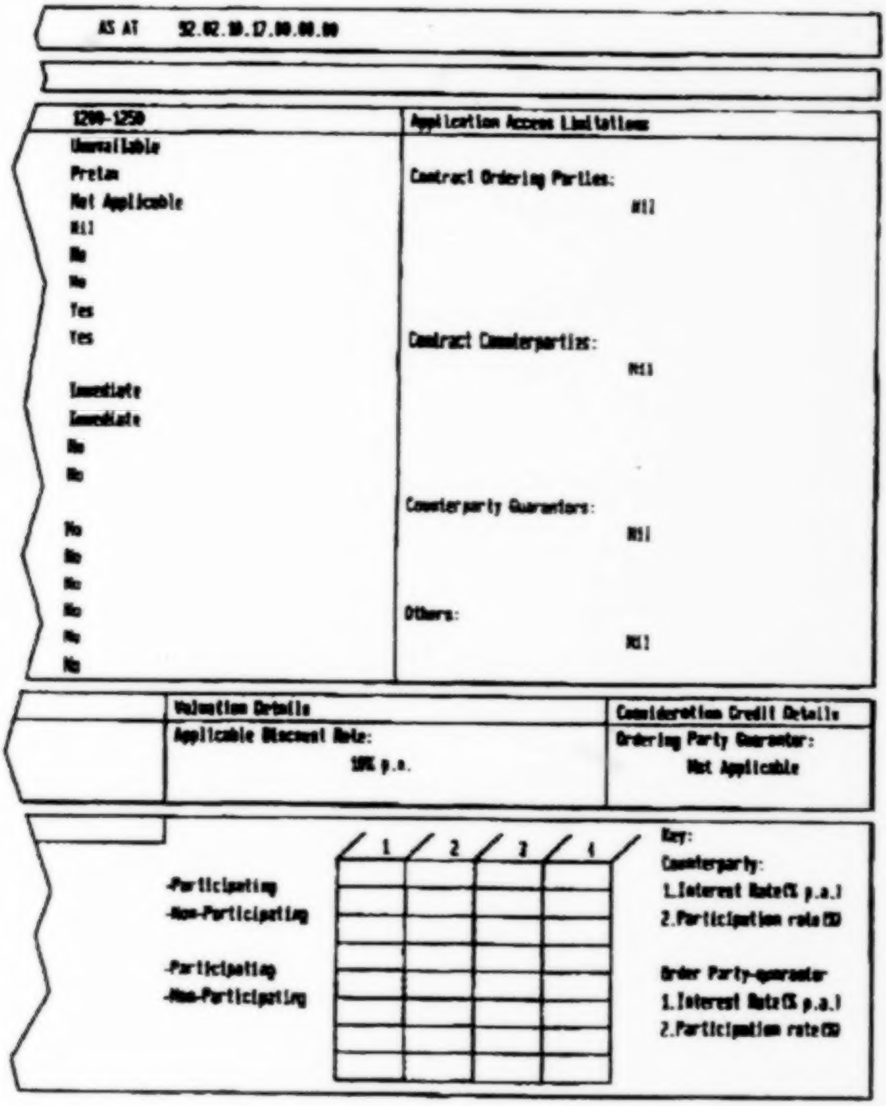
Application ID:	100	Applicable Product ID's
Application Promoter:	Bondata Inc	Preferred/preferential dealing?
Primary Application Use:	Defect liability management	Pre or Post Tax Matching?
Feasible Counterparty No's:	Single counterparty	Tax deduction/subsidy at source?
Public/private use?:	Public	Degree of Trading transparency:
Acceptable comms mediums:	Computer to computer	Secondary trading allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading allowed?
Pricing and Matching Process:	Minimize consideration payment under an EV/CE regime	Deferred Order Submissions possible?
		Partial Matches possible?
		Settlement terms: - considerations - entitlements
Contract Revaluation Frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit?
Ordering Parties allowed negative contract payoffs?	No	Collateralisation Payments? - Counterparties - Ordering Parties
Application Access Limitations:	Nil	Bilateral Obligations Netting?
		Bilateral Payments Netting?
		Multilateral Obligations Netting?
		Multilateral Payments Netting?

Netting Details (if applicable)		Collateralisation Details (if applicable)	
Applicable Discount Rate:	Not Applicable	Trustee:	Not Applicable
Obligation Netting trigger:	Not Applicable		
Min required settlements:	Not Applicable		

Ordering Party Consideration-Credit Options

Counterparty provided?	—Participating Basis:	—Ord. Party-guarantor protected --Unprotected
	—Non-Participating Basis:	—Ord. Party-guarantor protected --Unprotected
Ordering Party Guarantor provided?	--Participating Basis:	
	--Non-Participating Basis:	

FIG. 43B



AS AT 92.02.10.17.00.00.00

1200-1250

Unavailable

Pretax

Not Applicable

Nil

No

No

Yes

Yes

Immediate

Immediate

No

No

No

No

No

No

No

No

Application Access Limitations

Contract Ordering Parties:
Nil

Contract Counterparties:
Nil

Counterparty Guarantors:
Nil

Others:
Nil

Valuation Details

Applicable Discount Rate:
10% p.a.

Consideration Credit Details

Ordering Party Guarantor:
Not Applicable

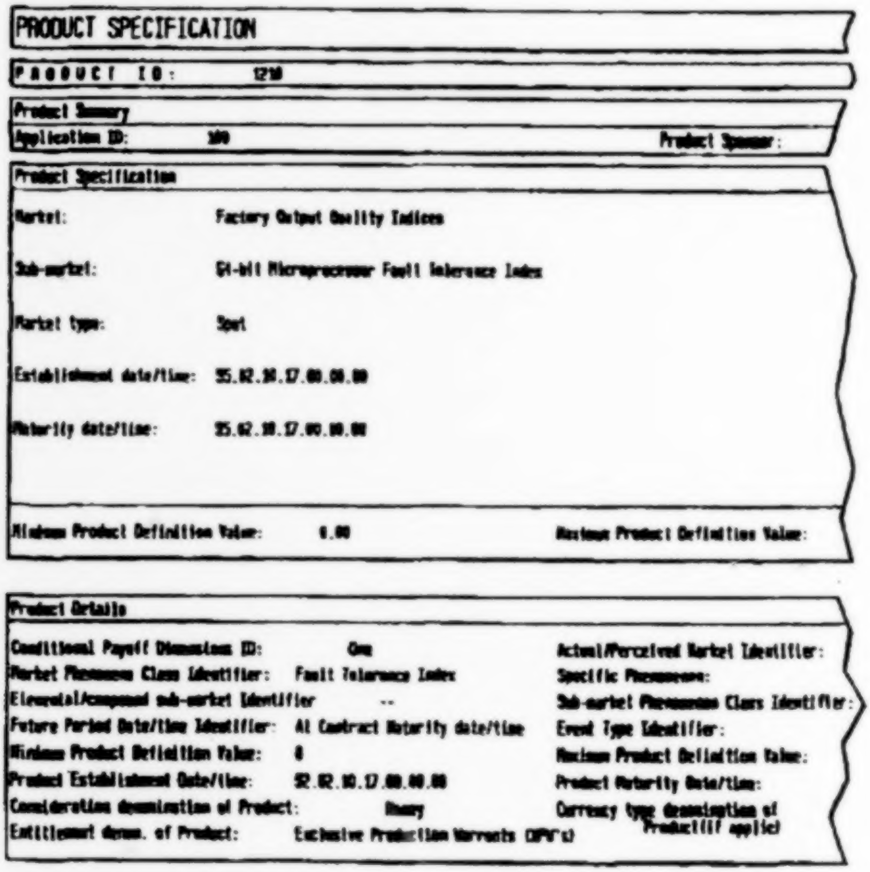
	1	2	3	4
-Participating				
-Non-Participating				
-Participating				
-Non-Participating				

Key:

Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Order Party-guarantor
1.Interest Rate(% p.a.)
2.Participation rate(%)

FIG. 44A



PRODUCT SPECIFICATION

PRODUCT ID: 1210

Product Summary

Application ID: 100 Product Sponsor:

Product Specification

Market: Factory Output Quality Indices

Sub-market: 64-bit Microprocessor Fault Tolerance Index

Market type: Spot

Establishment date/time: 55.02.10.17.00.00.00

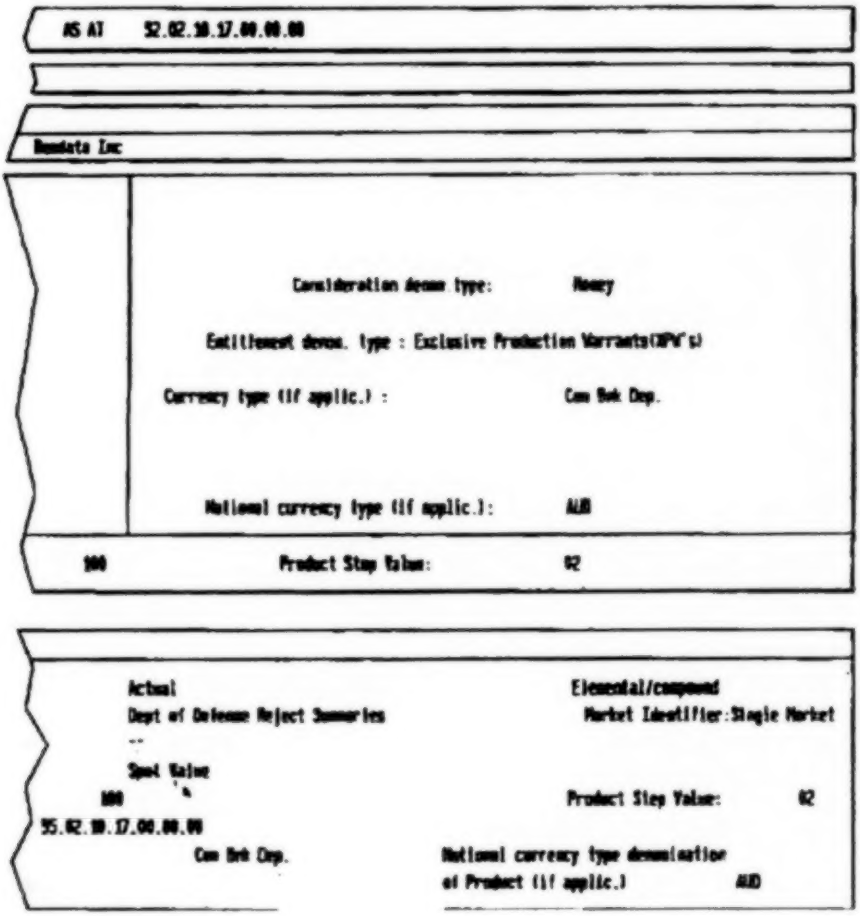
Maturity date/time: 55.02.10.17.00.00.00

Minimum Product Definition Value: 0.00 Maximum Product Definition Value:

Product Details

Conditional Payoff Dimension ID:	One	Actual/Perceived Market Identifier:
Market Phenomena Class Identifier:	Fault Tolerance Index	Specific Phenomenon:
Elemental/compound sub-market Identifier	--	Sub-market Phenomenon Class Identifier:
Future Period Date/time Identifier:	At Contract Maturity date/time	Event Type Identifier:
Minimum Product Definition Value:	0	Maximum Product Definition Value:
Product Establishment Date/time:	52.02.10.17.00.00.00	Product Maturity Date/time:
Consideration denomination of Product:	Money	Currency type denomination of Product(if applic)
Entitlement denom. of Product:	Exclusive Production Warrants (EPW's)	

FIG. 44B



AS AT 52.02.10.17.00.00.00

Bondata Inc

Consideration denom type: Money

Entitlement denom. type : Exclusive Production Warrants(XPW's)

Currency type (if applic.) : Com Bnk Dep.

National currency type (if applic.): AUD

100 Product Step Value: 02

Actual

Elemental/compound

Dept of Defense Reject Summaries

Market Identifier:Single Market

--

Spot Value

100

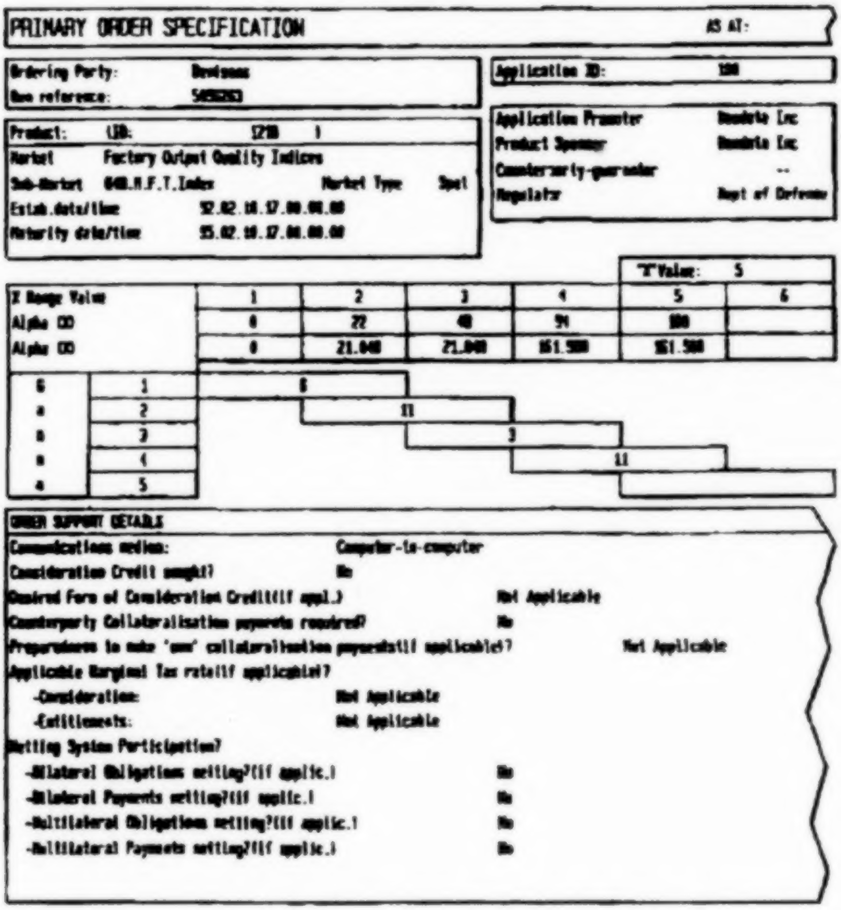
Product Step Value: 02

55.02.10.17.00.00.00

Com Bnk Dep.

National currency type denomination of Product (if applic.) AUD

FIG. 45A



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: Devisees
Own reference: 5456253

Application ID: 190

Product: UID: 1278 1
Market Factory Output Quality Indices
Sub-Market 040.M.F.T.Index Market Type Spot
Estab.date/time 52.02.18.17.00.00.00
Maturity date/time 55.02.19.17.00.00.00

Application Promoter Neodata Inc
Product Sponsor Neodata Inc
Counterparty-guarantor --
Regulator Dept of Defense

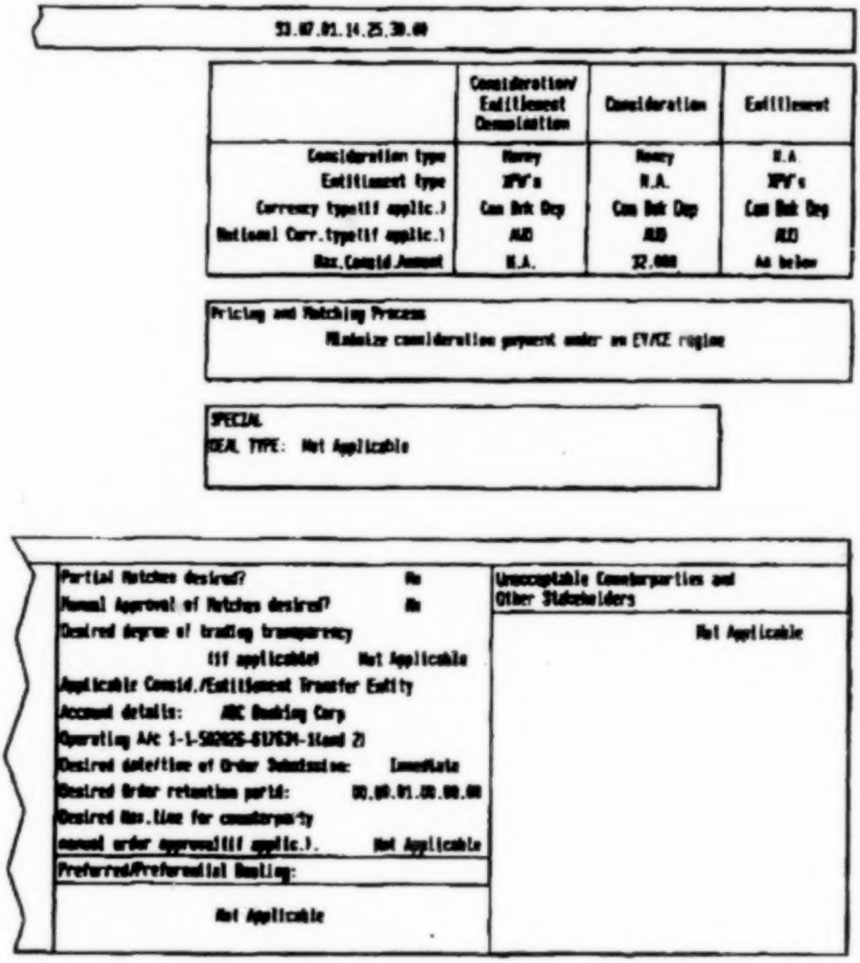
"X" Value: 5

X Range Value	1	2	3	4	5	6
Alpha OO	0	22	48	94	100	
Alpha OO	0	21.040	21.040	151.500	151.500	

6	1	8					
a	2		11				
0	3			3			
0	4				11		
4	5						

ORDER SUPPORT DETAILS
Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? No
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 45B



53.07.01.14.25.30.00

	Consideration/ Entitlement Combination	Consideration	Entitlement
Consideration type	Money	Money	N.A.
Entitlement type	XPV's	N.A.	XPV's
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	32,000	As below

Pricing and Matching Process

Minimize consideration payment under an EV/CE regime

SPECIAL

DEAL TYPE: Not Applicable

Partial Matches desired? No

Manual Approval of Matches desired? No

Desired degree of trading transparency (if applicable) Not Applicable

Applicable Consid./Entitlement Transfer Entity

Account details: ABC Banking Corp

Operating A/c 1-1-502026-017634-1(and 2)

Desired date/time of Order Submission: Immediate

Desired Order retention period: 00.00.01.00.00.00

Desired Max.time for counterparty manual order approval(if applic.). Not Applicable

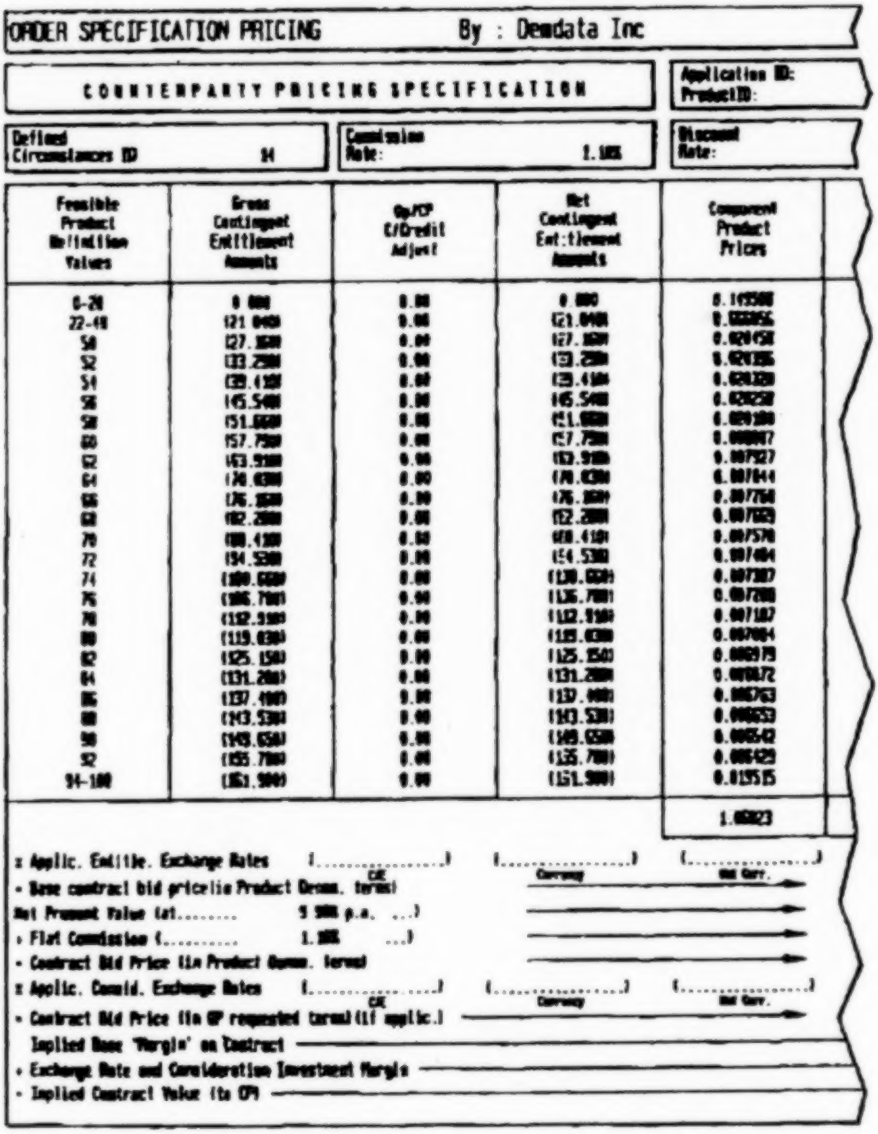
Preferred/Preferential Dealing:

Not Applicable

Unacceptable Counterparties and Other Stakeholders

Not Applicable

FIG. 46A



ORDER SPECIFICATION PRICING By : Demdata Inc

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID:

Defined Circumstances ID 34

Commission Rate: 1.10%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Cp/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
0-20	0.000	0.00	0.000	0.195500
22-48	(21.0400)	0.00	(21.0400)	[illegible]
50	(27.1600)	0.00	(27.1600)	0.020458
52	(33.2800)	0.00	(33.2800)	0.020365
54	(39.4100)	0.00	(39.4100)	0.020320
56	(45.5400)	0.00	(45.5400)	0.020258
58	(51.6600)	0.00	(51.6600)	0.020180
60	(57.7900)	0.00	(57.7900)	[illegible]
62	(63.9100)	0.00	(63.9100)	0.007927
64	(70.0300)	0.00	(70.0300)	0.007844
66	(76.1600)	0.00	(76.1600)	0.007760
68	(82.2800)	0.00	(82.2800)	0.007655
70	(88.4100)	0.00	(88.4100)	0.007570
72	(94.5300)	0.00	(94.5300)	0.007484
74	(100.6600)	0.00	(100.6600)	0.007387
76	(106.7800)	0.00	(106.7800)	0.007280
78	(112.9100)	0.00	(112.9100)	0.007187
80	(119.0300)	0.00	(119.0300)	0.007084
82	(125.1500)	0.00	(125.1500)	0.006979
84	(131.2800)	0.00	(131.2800)	0.006872
86	(137.4000)	0.00	(137.4000)	0.006763
88	(143.5300)	0.00	(143.5300)	0.006653
90	(149.6500)	0.00	(149.6500)	0.006542
92	(155.7800)	0.00	(155.7800)	0.006429
94-100	(161.9000)	0.00	(161.9000)	0.015515
				1.00023

x Applic. Entitle. Exchange Rates (.................) (.................) (.................)
CE Currency Bid Curr.
= Base contract bid price(in Product Denom. terms)
Net Present Value (at........ 5.00% p.a. ...)
+ Flat Commission (.......... 1.10% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (.................) (.................) (.................)
CE Currency Bid Curr.
= Contract Bid Price (in CP requested terms)(if applic.)
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (to CP)

FIG. 46B

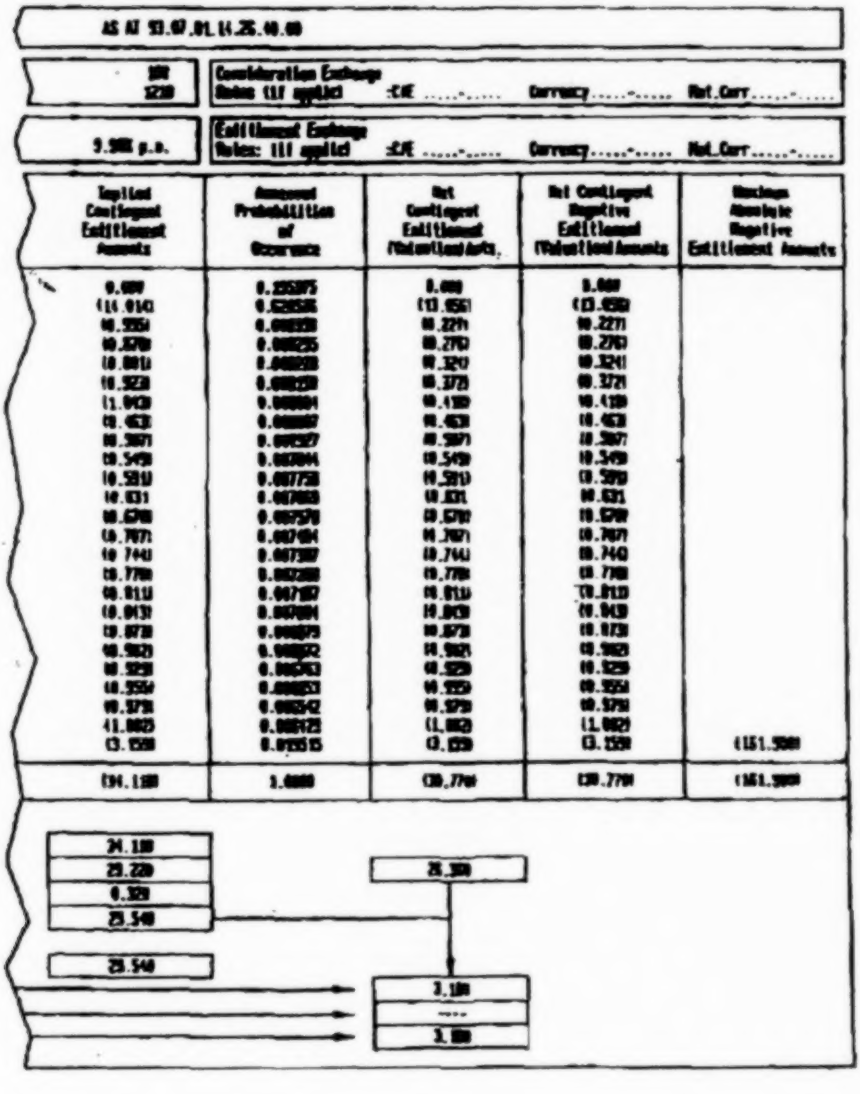
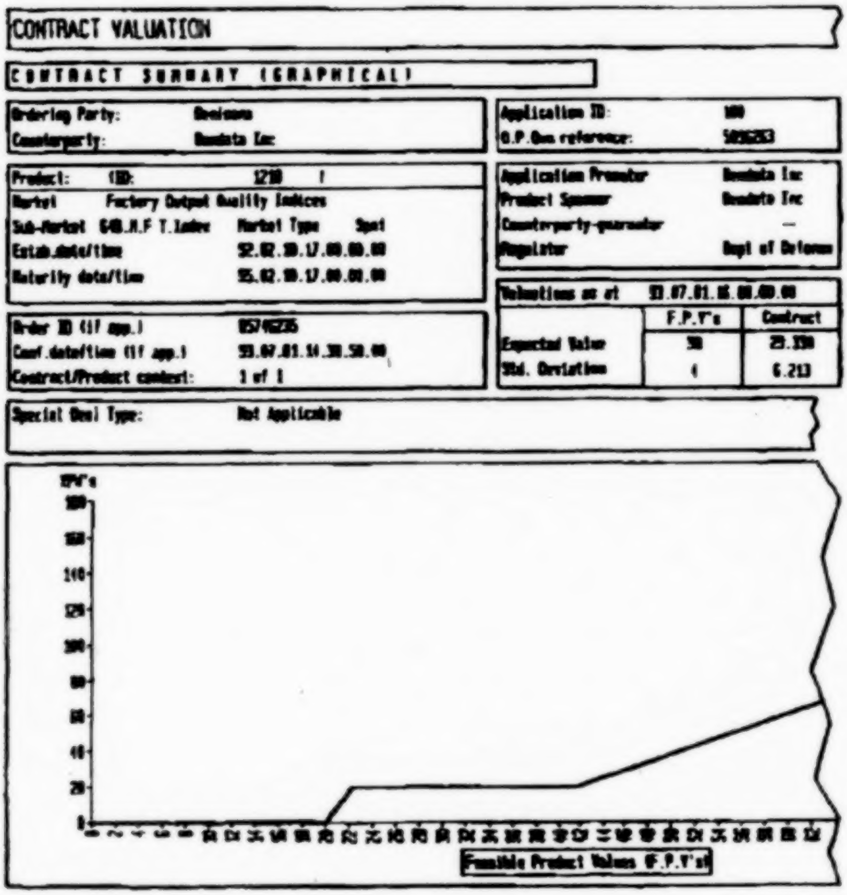

Consideration Exchange
Rates (if applic) ±C/E .....-..... Currency.....-..... Nat.Curr.....-.....
Entitlement Exchange
Rates: (if applic) ±C/E .....-..... Currency.....-..... Nat.Curr.....-.....
Implied Contingent Entitlement Amounts
Assessed Probabilities of Occurrence
Net Contingent Entitlement (Valuation) Amts.
Net Contingent Negative Entitlement (Valuation) Amounts
Maximum Absolute Negative Entitlement Amounts

FIG. 47A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Denisons
Counterparty: Bendata Inc

Product: (ID: 1210)
Market Factory Output Quality Indices
Sub-Market 648.H.F T.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Order ID (if app.) 05746235
Conf.date/time (if app.) 93.07.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 100
O.P.Own reference: 5096253

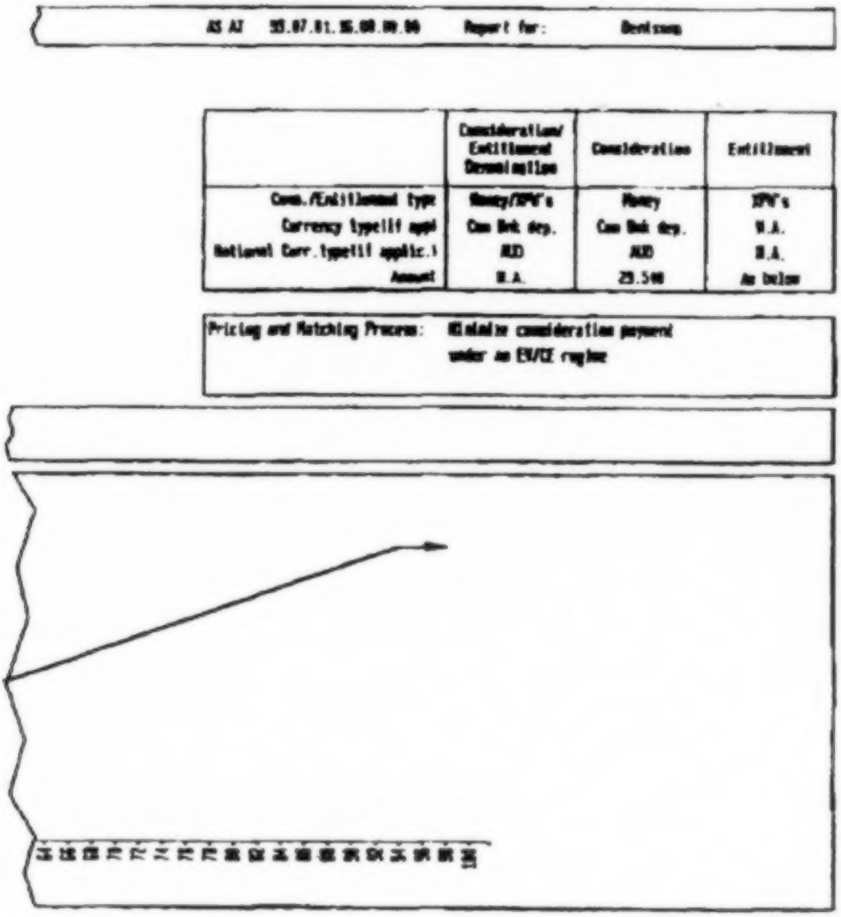
Application Promoter Bendata Inc
Product Sponsor Bendata Inc
Counterparty-guarantor —
Regulator Dept of Defense

Valuations as at 93.07.01.16.00.00.00

	F.P.V's	Contract
Expected Value	50	29.330
Std. Deviation	4	6.213

Special Deal Type: Not Applicable

FIG. 47B

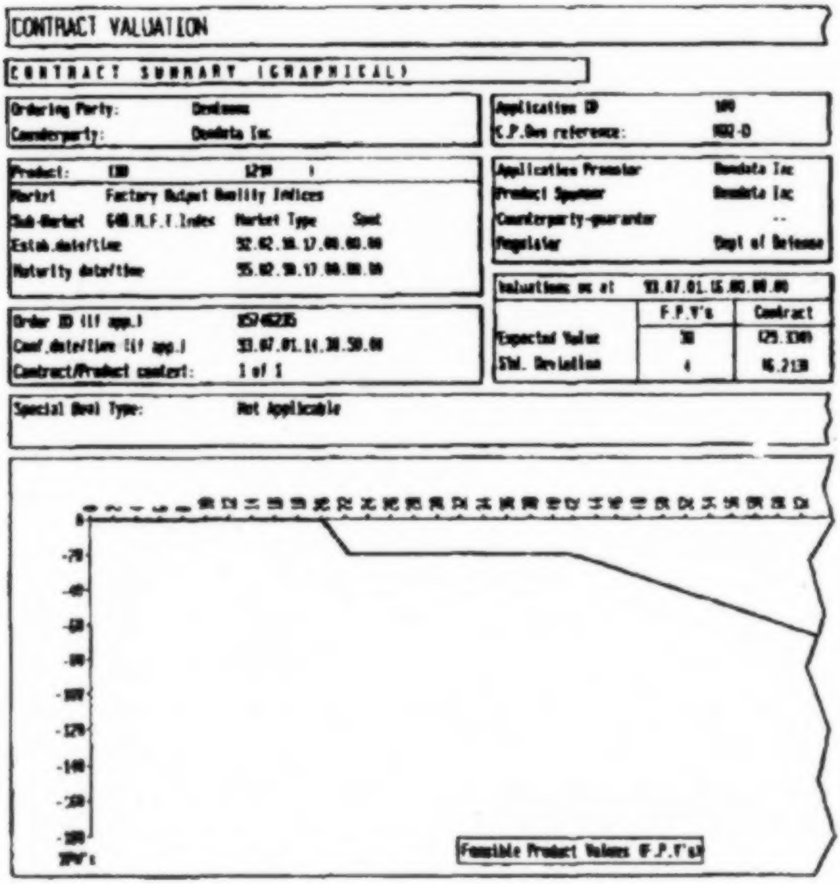


AS AT 99.07.01.15.00.00.00 Report for: Denison

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/IPV's	Money	IPV's
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	25.500	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CI regime

FIG. 48A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Dendeene
Counterparty: Dendata Inc

Product: 130 1290 1
Market Factory Output Quality Indices
Sub-Market 640.Q.F.I.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Order ID (if app.) 15746235
Conf.date/time (if app.) 93.07.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID 100
C.P.Own reference: 102-D

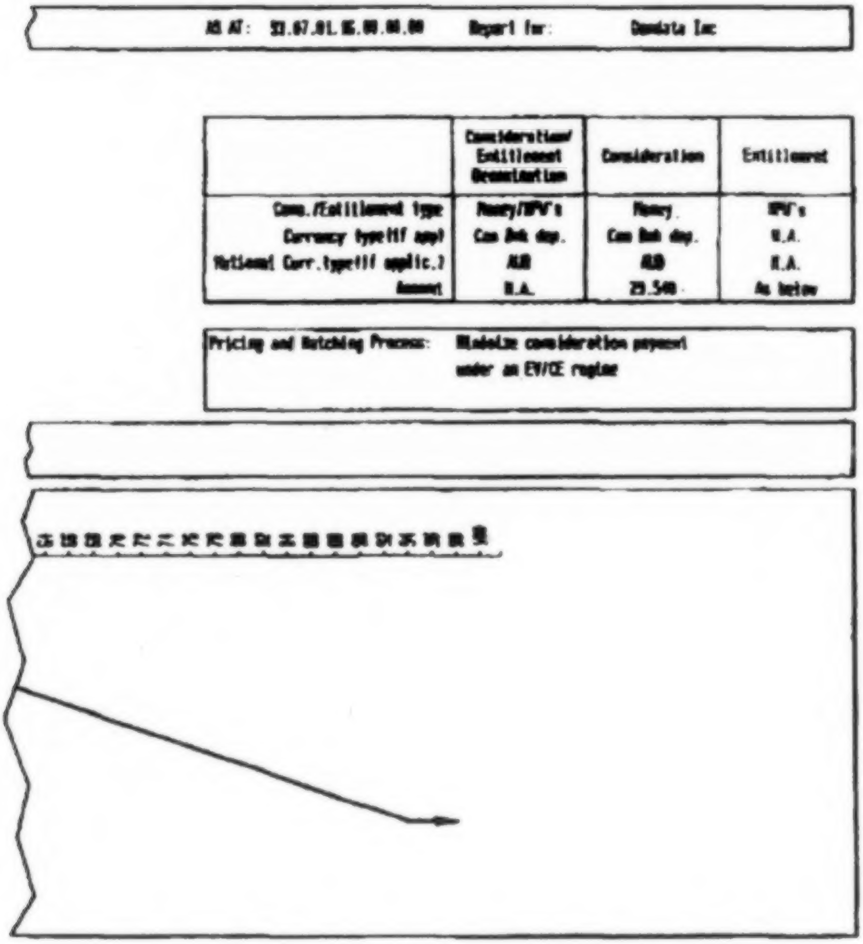
Application Promoter Dendata Inc
Product Sponsor Dendata Inc
Counterparty-guarantor --
Regulator Dept of Defense

Valuations as at 93.07.01.15.00.00.00

	F.P.V's	Contract
Expected Value	30	(25.3300)
Std. Deviation	4	16.2130

Special Deal Type: Not Applicable

FIG. 48B

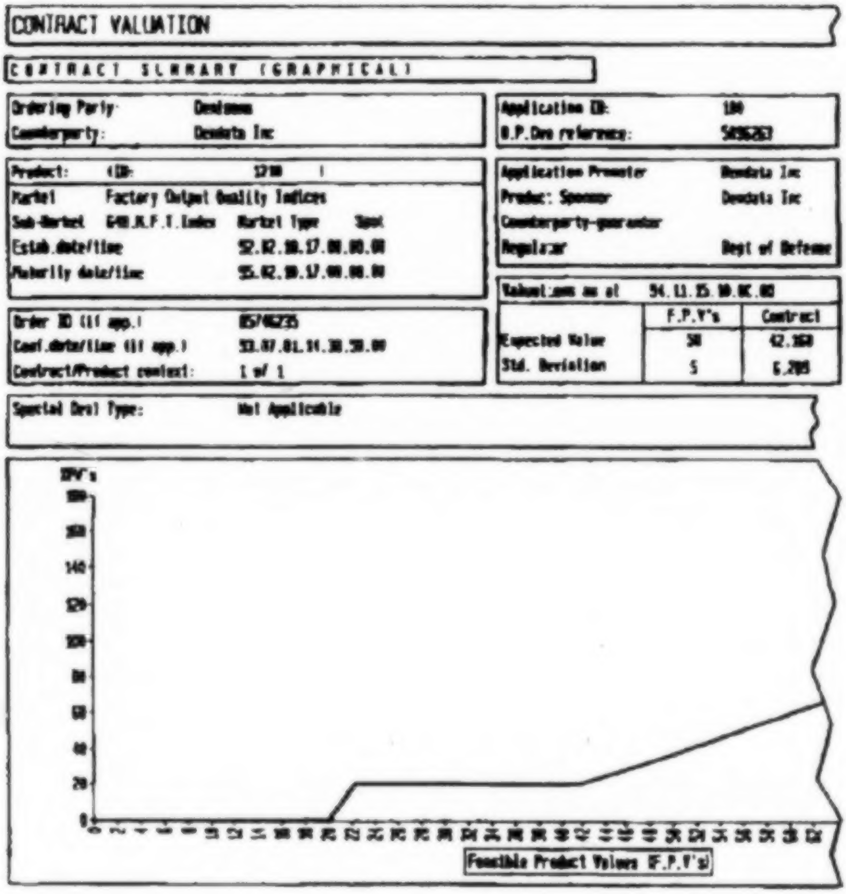


AS AT: 31.07.01.15.00.00.00 Report for: Dundata Inc

	Consideration/ Entitlement Organisation	Consideration	Entitlement
Cons./Entitlement type	Money/NPV's	Money.	NPV's
Currency type(if app)	Com Bnk dep.	Com Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	29.540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

FIG. 49A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: [illegible]
Counterparty: Dendata Inc

Product: (ID: 1710)
Market Factory Output Quality Indices
Sub-Market 640.N.F.T.Index Market Type Spot
Estab.date/time 52.02.18.17.00.00.00
Maturity date/time 55.02.10.17.00.00.00

Order ID (if app.) 05746235
Conf.date/time (if app.) 53.07.01.14.30.30.00
Contract/Product context: 1 of 1

Application ID: 180
O.P.Dev reference: 5696263

Application Promoter Dendata Inc
Product Sponsor Dendata Inc
Counterparty-guarantor
Regulator Dept of Defense

Valuations as at 54.11.15.10.00.00

	F.P.V's	Contract
Expected Value	58	42.360
Std. Deviation	5	6.285

Special Deal Type: Not Applicable

FIG. 49B

AS AT: 94.11.15.10.00.00.00 Report for: Dombsonc

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/NPV's	Money	NPV's
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	N.A.
Notional Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	25,540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

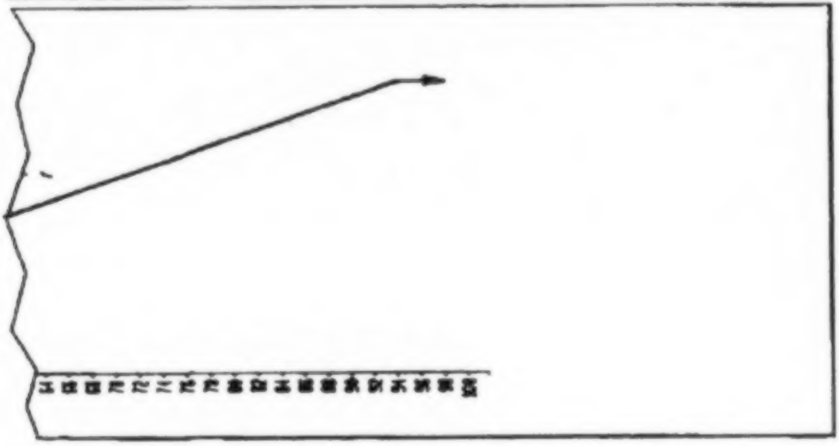
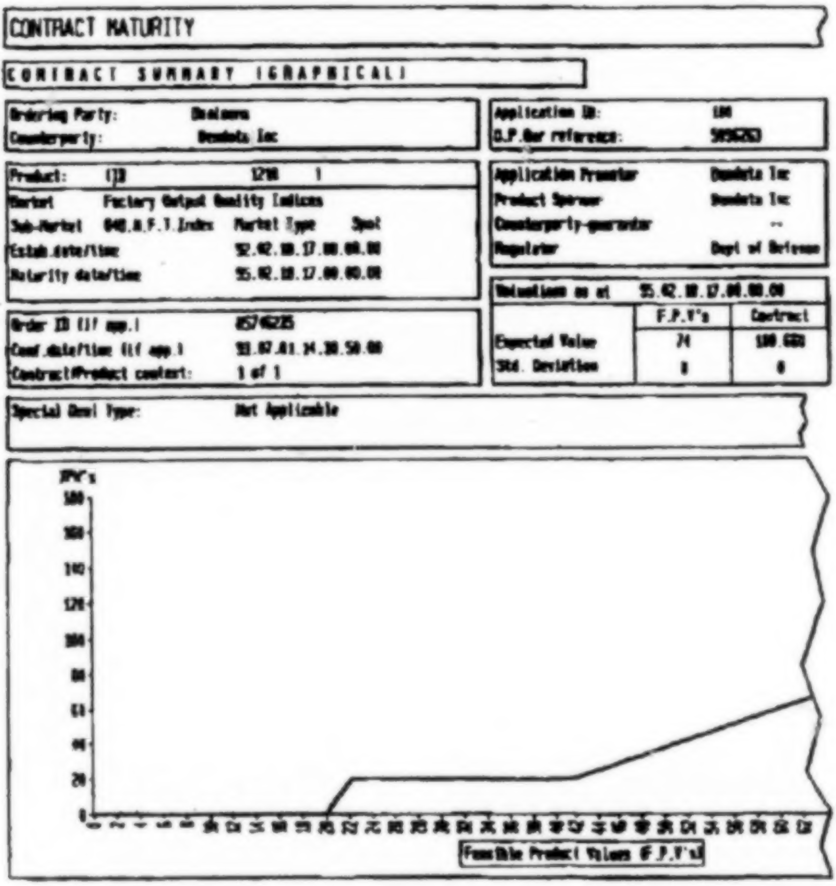


FIG. 50A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: [illegible]
Counterparty: [illegible] Inc

Application ID: 100
O.P. Our reference: 5896253

Product: (1) 1210 1
Market Factory Output Quality Indices
Sub-Market 040.A.F.I.Index Market Type Spot
Estab.date/time 52.02.10.17.00.00.00
Maturity date/time 55.02.10.17.00.00.00

Application Promoter [illegible] Inc
Product Sponsor [illegible] Inc
Counterparty-guarantor --
Regulator Dept of Defense

Order ID (if app.) 8574225
Conf.date/time (if app.) 53.07.01.14.30.50.00
Contract/Product content: 1 of 1

Valuations as at 55.02.10.17.00.00.00

	F.P.V's	Contract
Expected Value	74	100.000
Std. Deviation	0	0

Special Deal Type: Not Applicable

FIG. 50B

AS AT: 95.02.10.17.00.00.00 Report for: Vendors

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/XPV's	Money	XPV's
Currency type(if appl	Can Bnk dep.	Can Bnk dep.	N.A.
Notional Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	23,540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

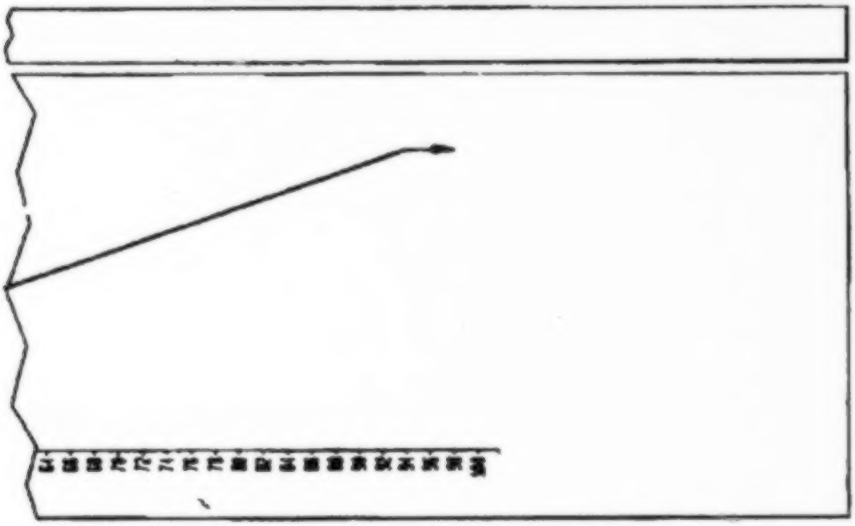
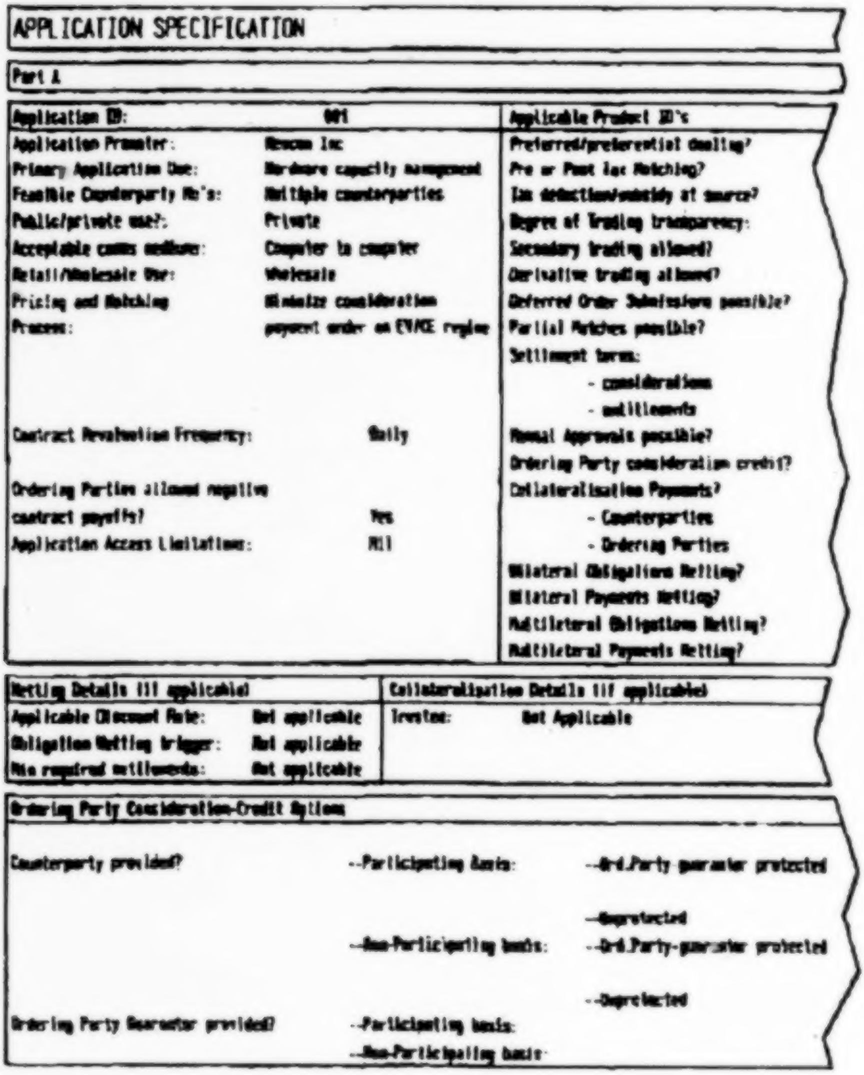


FIG. 51A



APPLICATION SPECIFICATION

Part A

Application ID:	001
Application Promoter:	Rescom Inc
Primary Application Use:	Hardware capacity management
Feasible Counterparty No's:	Multiple counterparties
Public/private use?:	Private
Acceptable comms medium:	Computer to computer
Retail/Wholesale Use:	Wholesale
Pricing and Matching	Minimize consideration
Process:	payment under an EV/CE regime
Contract Revaluation Frequency:	Daily
Ordering Parties allowed negative contract payoffs?	Yes
Application Access Limitations:	Nil

Applicable Product ID's

Preferred/preferential dealing?
Pre or Post Tax Matching?
Tax deduction/subsidy at source?
Degree of Trading transparency:
Secondary trading allowed?
Derivative trading allowed?
Deferred Order Submissions possible?
Partial Matches possible?
Settlement terms:
- considerations
- entitlements
Manual Approvals possible?
Ordering Party consideration credit?
Collateralisation Payments?
- Counterparties
- Ordering Parties
Bilateral Obligations Netting?
Bilateral Payments Netting?
Multilateral Obligations Netting?
Multilateral Payments Netting?

Netting Details (if applicable)

Applicable Discount Rate:	Not applicable
Obligation Netting trigger:	Not applicable
Min required settlements:	Not applicable

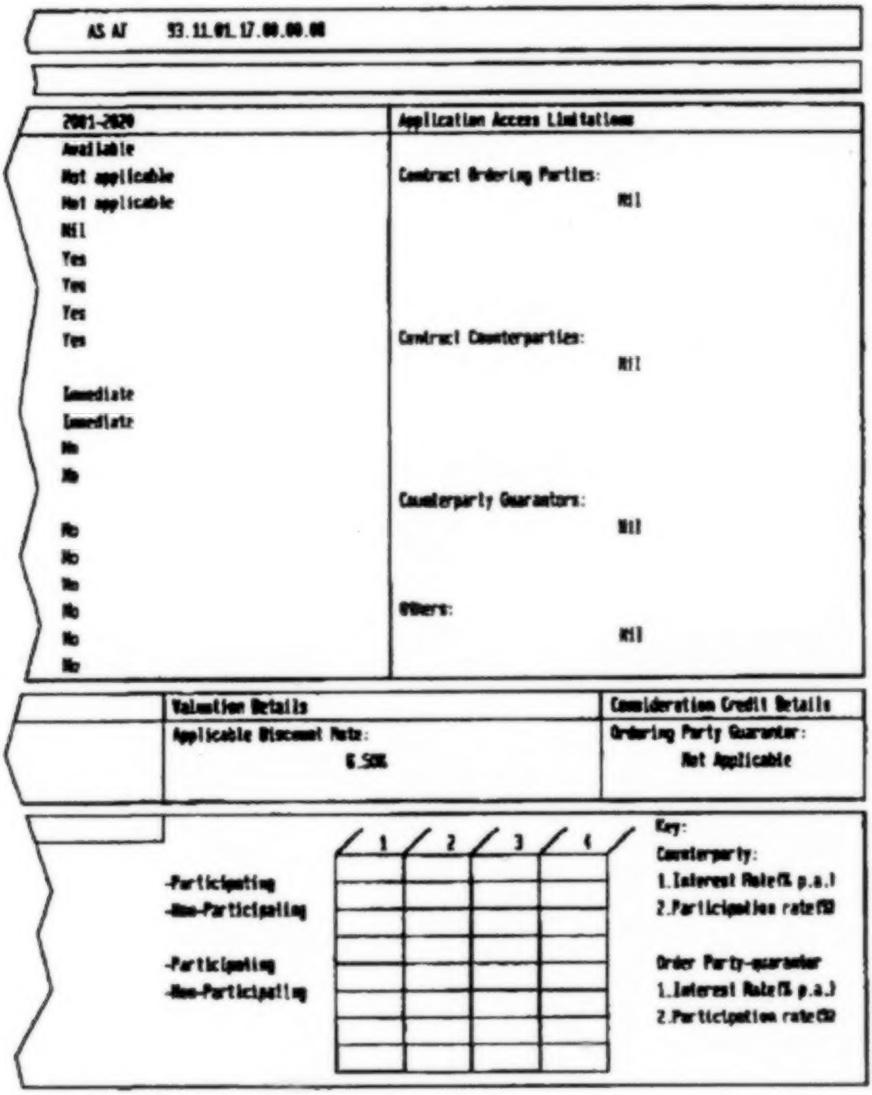
Collateralisation Details (if applicable)

Trustee: Not Applicable

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating basis:	--3rd.Party guarantor protected
		--Unprotected
	--Non-Participating basis:	--3rd.Party-guarantor protected
		--Unprotected
Ordering Party Guarantor provided?	--Participating basis:	
	--Non-Participating basis:	

FIG. 51B



AS AT 93.11.01.17.00.00.00

2001-2020	Application Access Limitations
Available Not applicable Not applicable Nil Yes Yes Yes Yes Immediate Immediate No No No No No No No No	Contract Ordering Parties: Nil Contract Counterparties: Nil Counterparty Guarantors: Nil Others: Nil

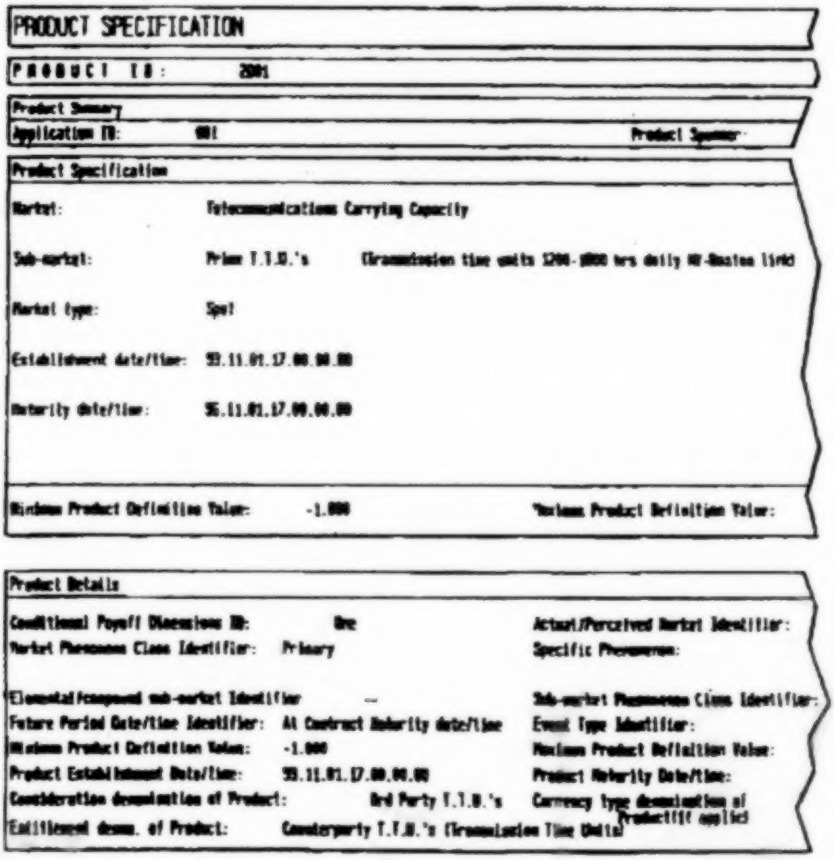
	Valuation Details	Consideration Credit Details
	Applicable Discount Rate: 6.50%	Ordering Party Guarantor: Not Applicable

	1	2	3	4
-Participating				
-Non-Participating				
-Participating				
-Non-Participating				

Key:
Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Order Party-guarantor
1.Interest Rate(% p.a.)
2.Participation rate(%)

FIG. 52A



PRODUCT SPECIFICATION

PRODUCT ID: 2001

Product Summary

Application ID: 001

Product Sponsor:

Product Specification

Market: Telecommunications Carrying Capacity

Sub-market: Prime T.T.U.'s (transmission time units 1200-1800 hrs daily NY-Boston link)

Market type: Spot

Establishment date/time: 95.11.01.17.00.00.00

Maturity date/time: 95.11.01.17.00.00.00

Minimum Product Definition Value: -1.000

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Actual/Perceived Market Identifier:

Market Phenomenon Class Identifier: Primary

Specific Phenomenon:

Elemental/compound sub-market Identifier —

Sub-market Phenomenon Class Identifier:

Future Period Date/time Identifier: At Contract Maturity date/time

Event Type Identifier:

Minimum Product Definition Value: -1.000

Maximum Product Definition Value:

Product Establishment Date/time: 95.11.01.17.00.00.00

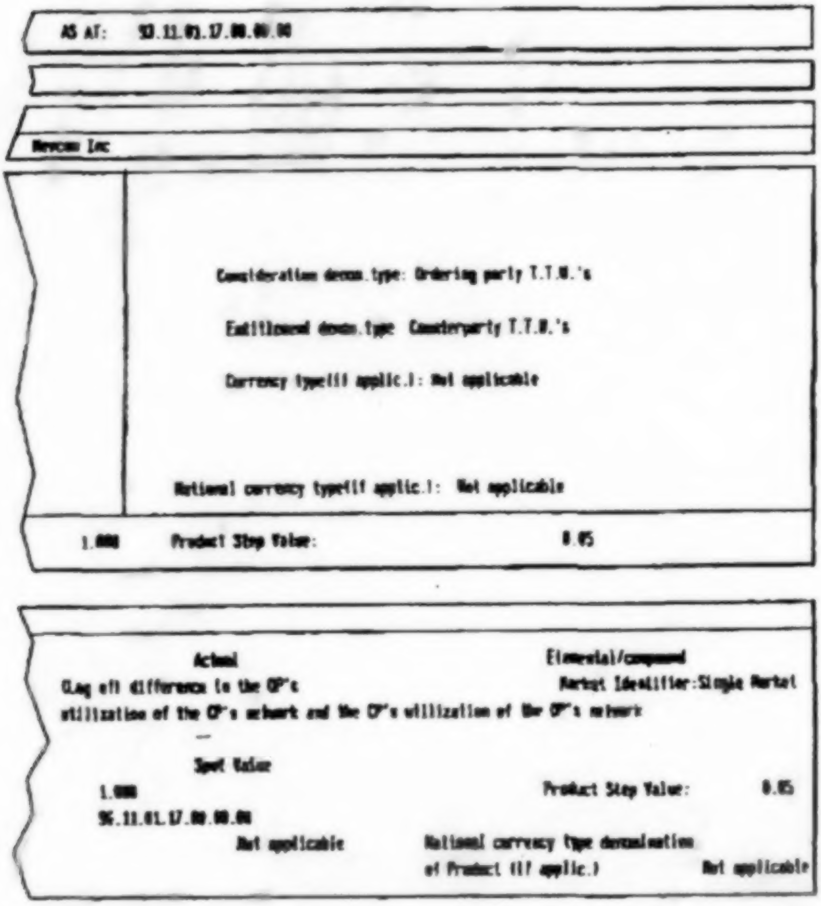
Product Maturity Date/time:

Consideration denomination of Product: 3rd Party T.T.U.'s

Currency type denomination of Product(if applic)

Entitlement denom. of Product: Counterparty T.T.U.'s (Transmission Time Units)

FIG. 52B



AS AT: 96.11.01.17.00.00.00

Newcom Inc

Consideration denom.type: Ordering party T.T.U.'s

Entitlement denom.type Counterparty T.T.U.'s

Currency type(if applic.): Not applicable

National currency type(if applic.): Not applicable

1.000 Product Step Value: 0.05

Actual

Elemental/compound

CLog off difference in the CP's

Market Identifier:Single Market

utilization of the CP's network and the CP's utilization of the CP's network

—

Spot Value

1.000

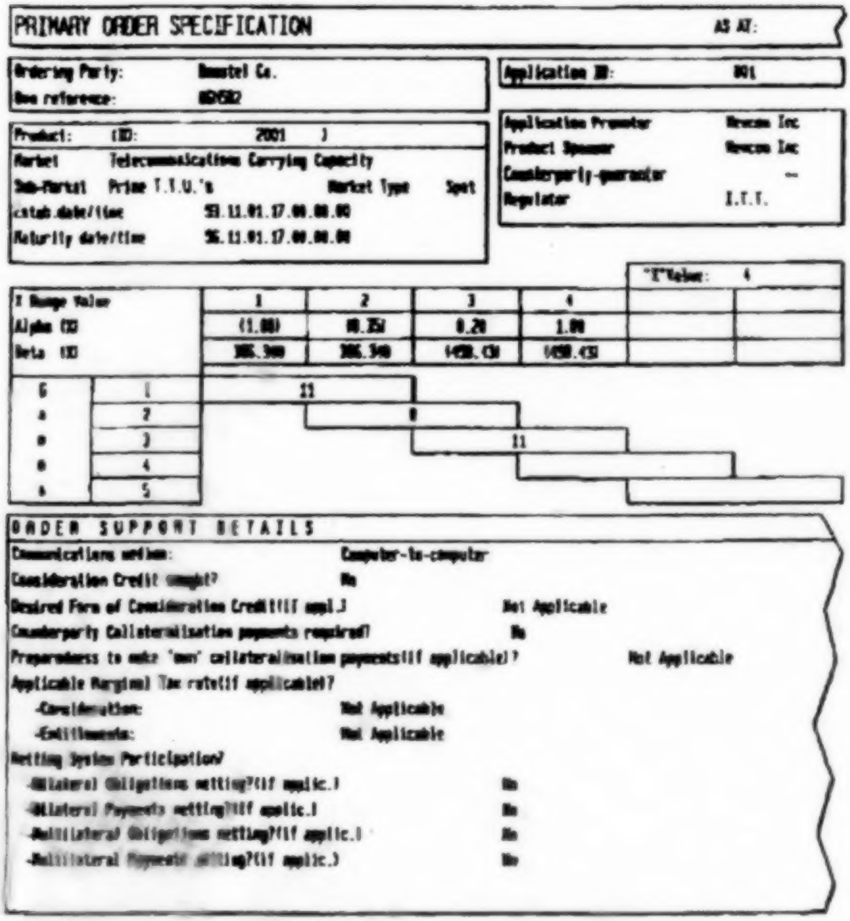
Product Step Value: 0.05

96.11.01.17.00.00.00

Not applicable

National currency type denomination of Product (if applic.) Not applicable

FIG. 53A



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: [illegible] Co.
Own reference: 60/582

Application ID: 001

Product: (ID: 2001)
Market Telecommunications Carrying Capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 93.11.01.17.00.00.00
Maturity date/time 96.11.01.17.00.00.00

Application Promoter Nexcom Inc
Product Sponsor Nexcom Inc
Counterparty-guarantor —
Regulator I.T.T.

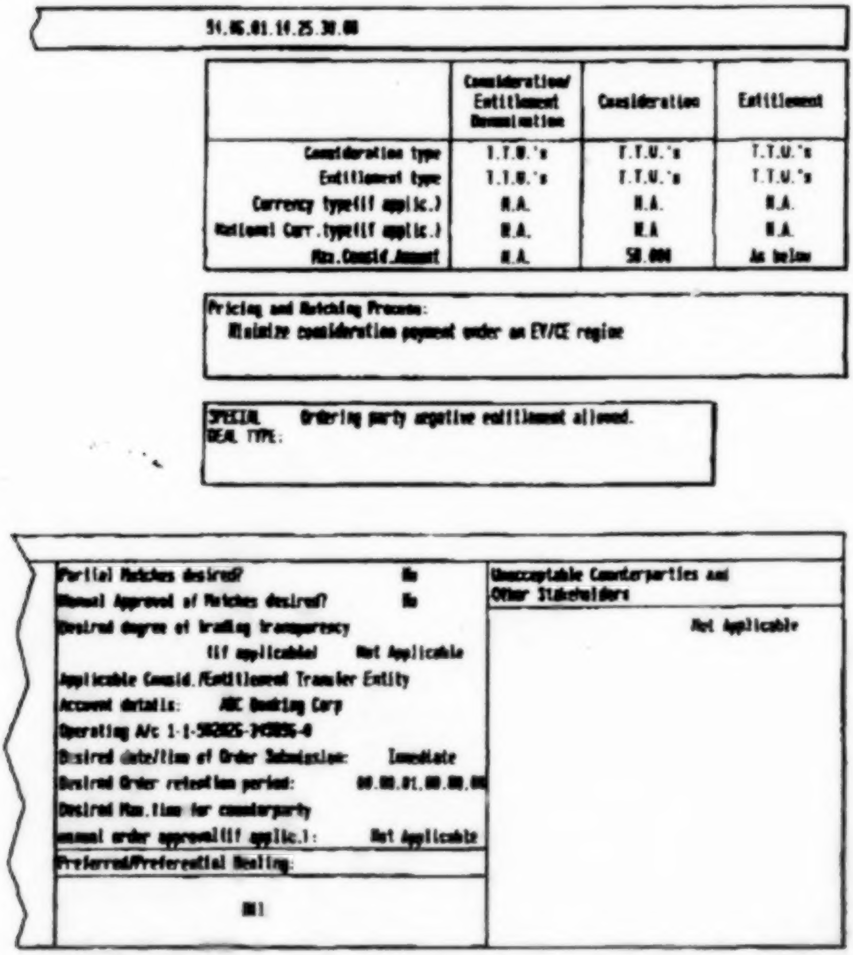
"I"Value: 4

I Range Value		1	2	3	4		
Alpha (%)		(1.00)	(0.25)	0.20	1.00		
Beta (%)		305.340	305.340	(450.43)	(450.43)		
G	1	11					
a	2		0				
m	3			11			
m	4						
a	5						

ORDER SUPPORT DETAILS

Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? No
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 53B



94.05.01.14.25.30.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Consideration type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if applic.)	N.A.	N.A.	N.A.
Notional Curr. type(if applic.)	N.A.	N.A	N.A.
Max.Consid.Amount	N.A.	50.000	As below

Pricing and Matching Process:
Minimize consideration payment under an EV/CE regime

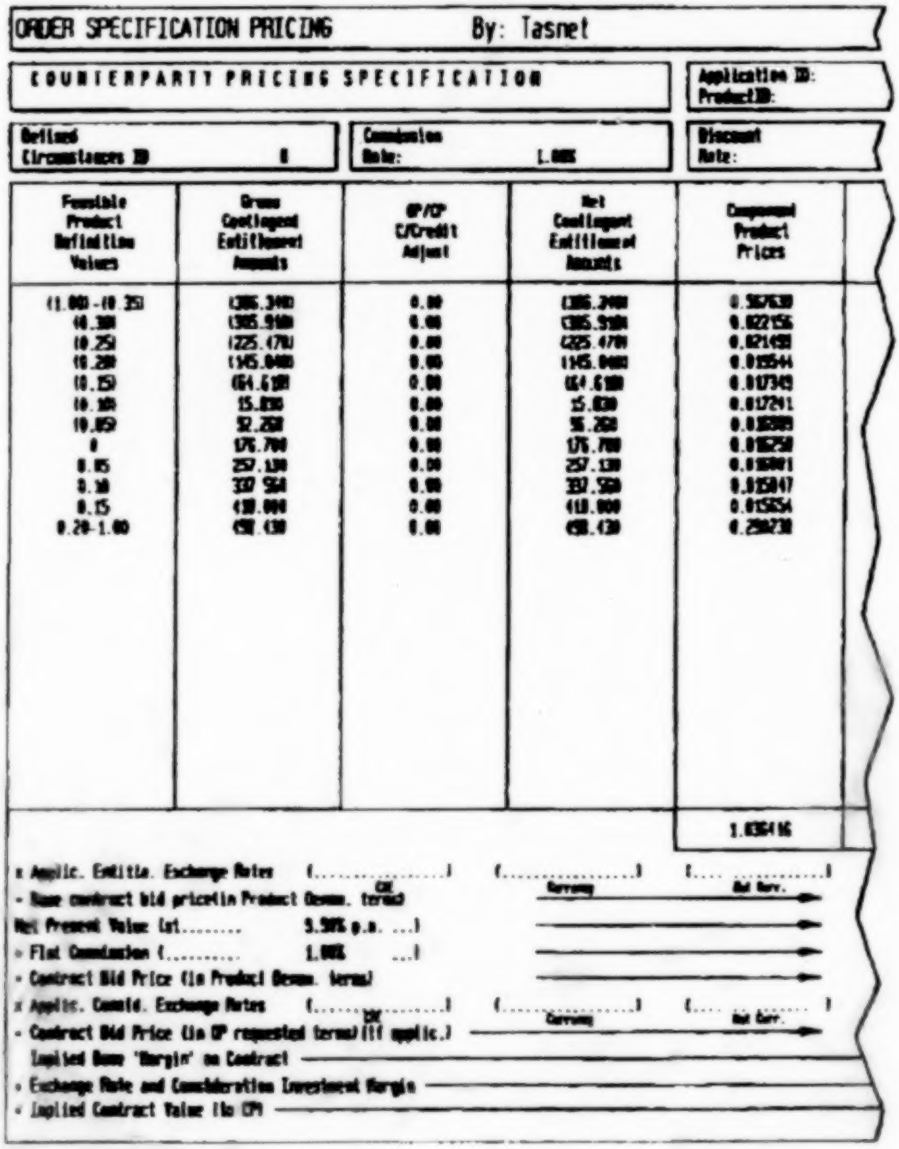
SPECIAL DEAL TYPE: Ordering party negative entitlement allowed.

Partial Matches desired? No
Manual Approval of Matches desired? No
Desired degree of trading transparency (if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-502025-345056-0
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty manual order approval(if applic.): Not Applicable

Preferred/Preferential Dealing:
Nil

Unacceptable Counterparties and Other Stakeholders
Not Applicable

FIG. 54A



ORDER SPECIFICATION PRICING By: Tasnet

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID 0

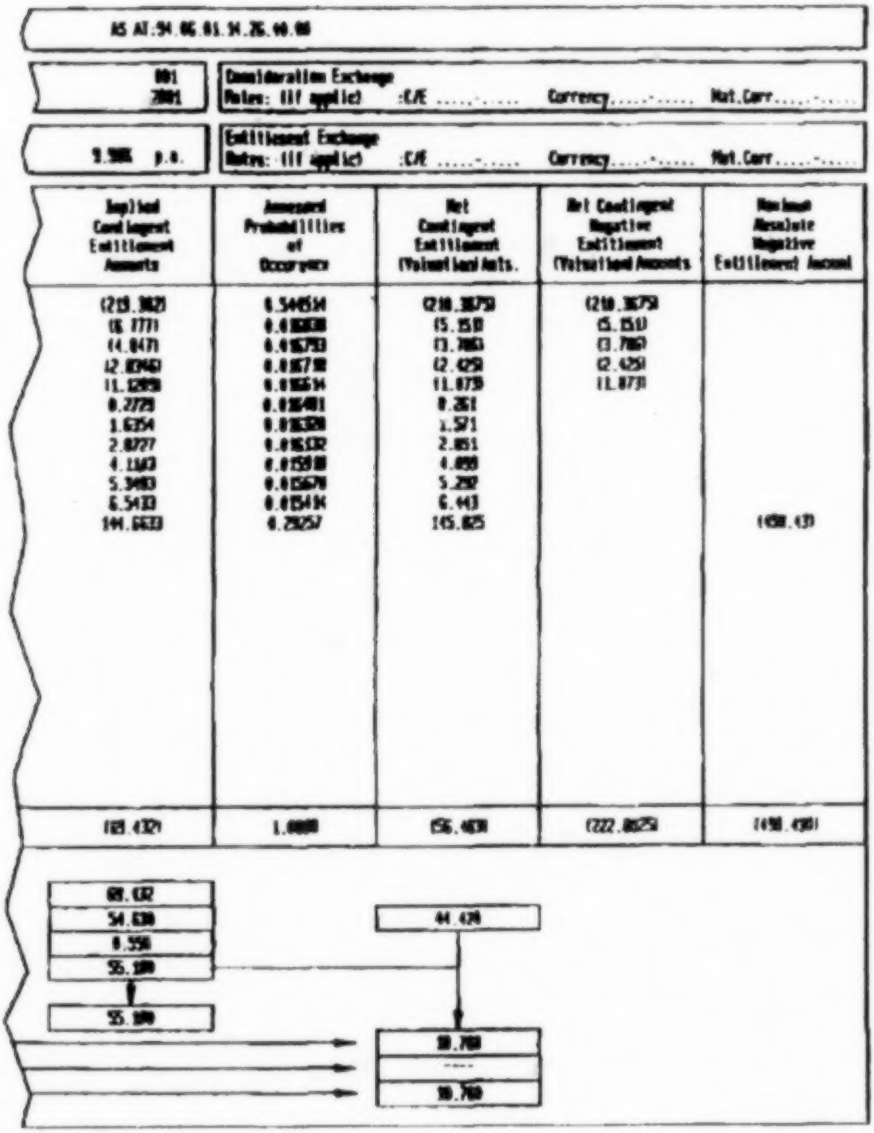
Commission Rate: 1.00%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	OP/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
(1.00)-(0.35)	(306.340)	0.00	(306.340)	0.567630
(0.30)	(305.910)	0.00	(305.910)	0.022156
(0.25)	(225.470)	0.00	(225.470)	0.021450
(0.20)	(145.040)	0.00	(145.040)	0.019544
(0.15)	(64.610)	0.00	(64.610)	0.017349
(0.10)	15.830	0.00	15.830	0.017241
(0.05)	96.260	0.00	96.260	0.016909
0	176.700	0.00	176.700	0.016250
0.05	257.130	0.00	257.130	0.016001
0.10	337.560	0.00	337.560	0.015047
0.15	418.000	0.00	418.000	0.015654
0.20-1.00	498.430	0.00	498.430	0.290230
				1.036416

x Applic. Entitle. Exchange Rates (..................) (..................) (..................)
= Base contract bid price (in Product Denom. terms) CX Currency Bid Curr.
Net Present Value (at........ 5.50% p.a. ...)
+ Flat Commission (.......... 1.00% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (..................) (..................) (..................)
= Contract Bid Price (in OP requested terms) (if applic.) CX Currency Bid Curr.
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (to CP)

FIG. 54B



AS AT:94.06.01.14.26.40.00

001
2001

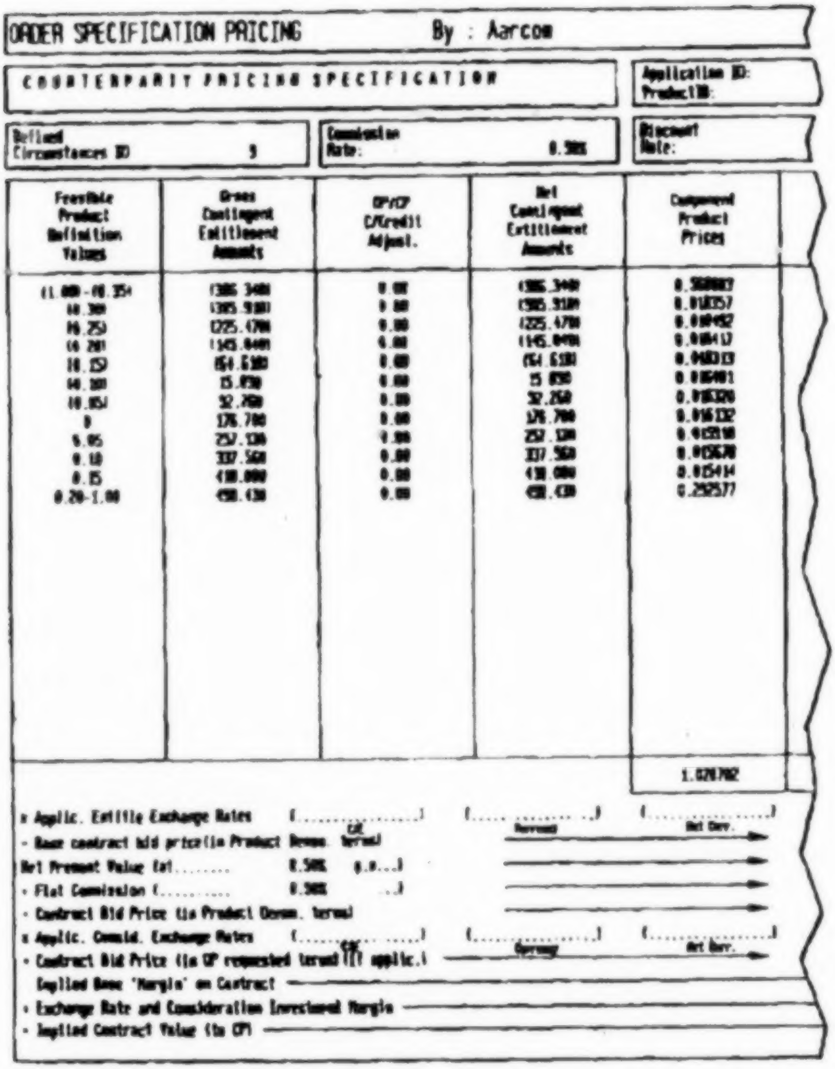
Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

9.90% p.a.

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurrence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(213.382)	0.540514	(210.3875)	(210.3875)	
(6.7771)	0.018838	(5.150)	(5.151)	
(4.0471)	0.016793	(3.786)	(3.786)	
(2.8346)	0.016718	(2.425)	(2.425)	
(1.1289)	0.016514	(1.073)	(1.073)	
0.2728	0.016401	0.261		
1.6354	0.016320	1.571		
2.8727	0.016132	2.851		
4.1167	0.015910	4.098		
5.3403	0.015679	5.292		
6.5433	0.015414	6.443		
144.6633	0.29257	145.025		(450.43)
(68.432)	1.0000	(56.403)	(222.8825)	(450.430)

FIG. 55A



ORDER SPECIFICATION PRICING By : Aarcom

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID 3

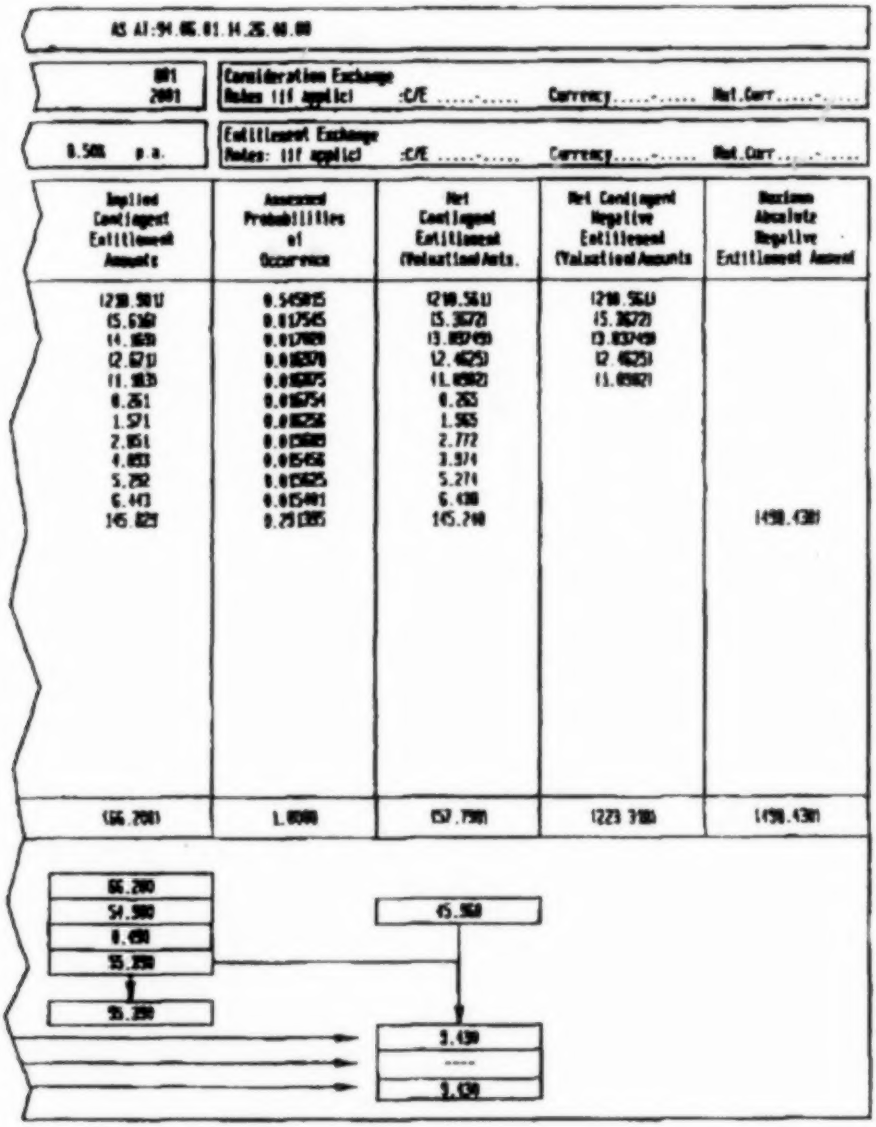
Commission Rate: 0.50%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	CP/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
(1.00-(0.35)	(385.340)	0.00	(385.340)	0.568887
(0.30)	(305.910)	0.00	(305.910)	0.010357
(0.25)	(225.470)	0.00	(225.470)	0.010452
(0.20)	(145.040)	0.00	(145.040)	0.010413
(0.15)	(64.610)	0.00	(64.610)	0.040313
(0.10)	15.850	0.00	15.850	0.016401
(0.05)	96.280	0.00	96.280	0.016326
0	176.700	0.00	176.700	0.016132
0.05	257.130	0.00	257.130	0.015910
0.10	337.560	0.00	337.560	0.015670
0.15	418.000	0.00	418.000	0.015414
0.20-1.00	498.430	0.00	498.430	0.292577
				1.020702

x Applic. Entitle Exchange Rates (..................) (..................) (..................)
CCE Currency Act Curr.
- Base contract bid price (in Product Denom. terms)
Net Present Value (at........ 0.50% p.a....)
+ Flat Commission (.......... 0.50% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (..................) (..................) (..................)
CCE Currency Act Curr.
= Contract Bid Price (in CP requested terms) (if applic.)
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (to CP)

FIG. 55B



AS AT:94.06.01.14.25.40.00

001
2001

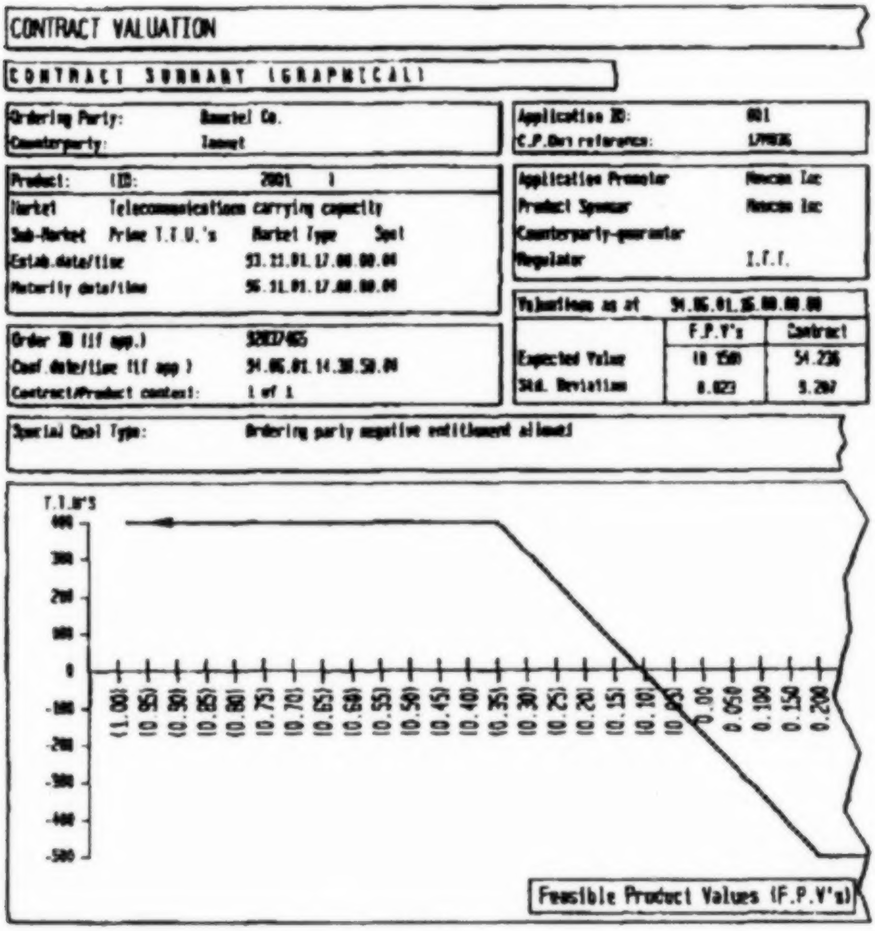
Consideration Exchange
Rates (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

0.50% p.a.

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurrence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(230.501)	0.545015	(210.561)	(210.561)	
(5.636)	0.017545	(5.3672)	(5.3672)	
(4.165)	0.017089	(3.83749)	(3.83749)	
(2.671)	0.016370	(2.4625)	(2.4625)	
(1.183)	0.016075	(1.0582)	(1.0582)	
0.261	0.016754	0.253		
1.571	0.016256	1.565		
2.851	0.015605	2.772		
4.033	0.015456	3.974		
5.252	0.015625	5.274		
6.443	0.015401	6.438		
145.825	0.251385	145.240		(450.430)
(66.200)	1.0000	(57.790)	(223.310)	(450.430)

FIG. 56A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bamtel Co.
Counterparty: Iannet

Application ID: 001
C.P.Ord reference: 179836

Product: (ID: 2001)
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 93.11.01.17.00.00.00
Maturity date/time 96.11.01.17.00.00.00

Application Promoter Nexcom Inc
Product Sponsor Nexcom Inc
Counterparty-guarantor
Regulator I.T.I.

Order ID (if app.) 3203765
Conf.date/time (if app.) 94.06.01.14.30.50.00
Contract/Product context: 1 of 1

Valuations as at 94.06.01.15.00.00.00

	F.P.V's	Contract
Expected Value	(0.150)	54.236
Std. Deviation	0.023	5.207

Special Deal Type: Ordering party negative entitlement allowed

T.T.U'S
400
300
200
100
0
-100
-200
-300
-400
-500
(1.00)
(0.95)
(0.90)
(0.85)
(0.80)
(0.75)
(0.70)
(0.65)
(0.60)
(0.55)
(0.50)
(0.45)
(0.40)
(0.35)
(0.30)
(0.25)
(0.20)
(0.15)
(0.10)
(0.05)
0.00
0.050
0.100
0.150
0.200
Feasible Product Values (F.P.V's)

FIG. 56B

AS AT 94.06.01.16.00.00.00 Report for: Basstel Co.

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if app)	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,180	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

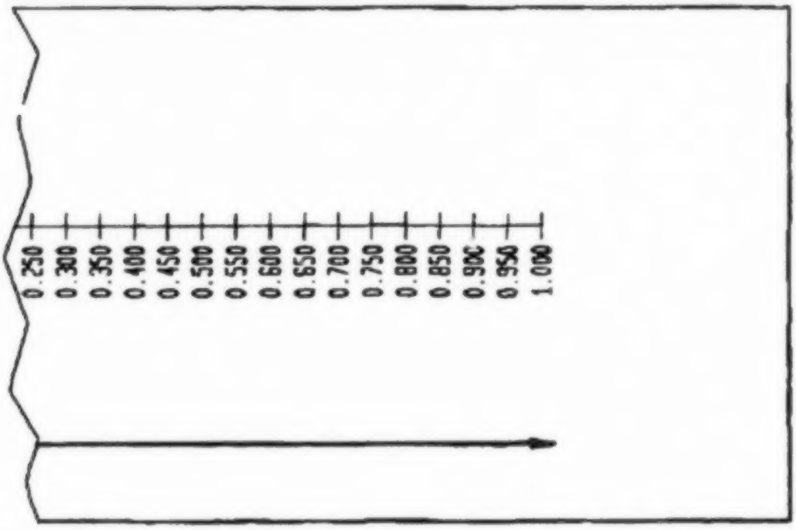
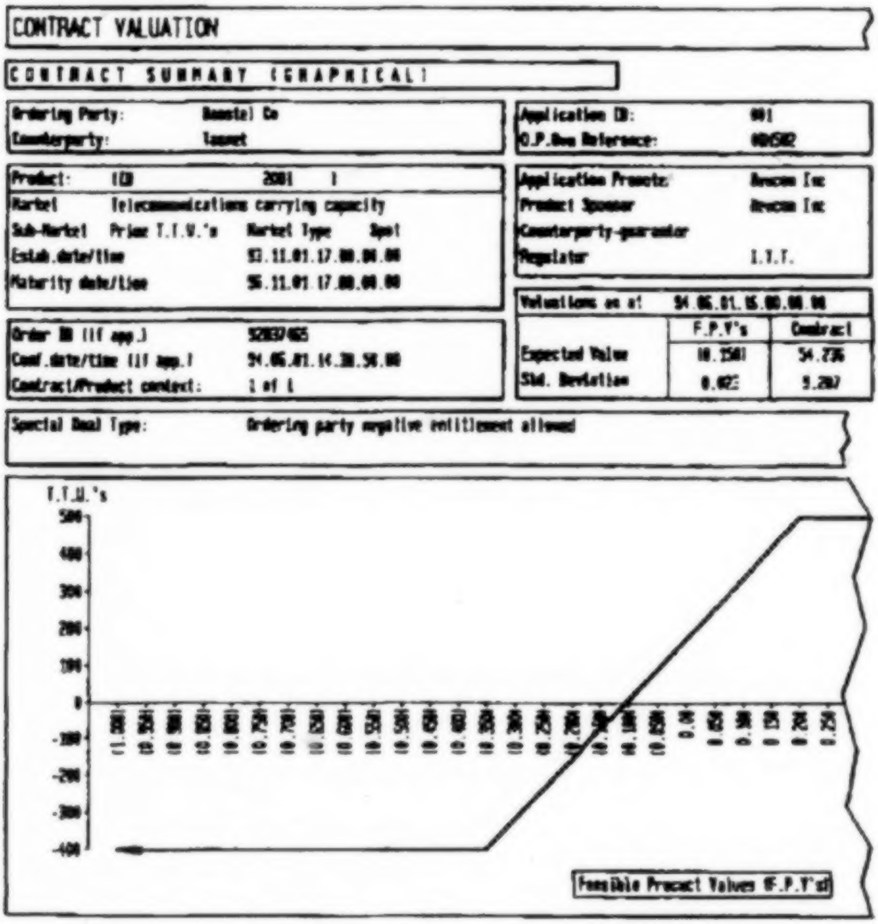

0.250
0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 57A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bamstel Co
Counterparty: Tasmet

Application ID: 001
O.P.Own Reference: 00/502

Product: ICD 2001 1
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 93.11.01.17.00.00.00
Maturity date/time 95.11.01.17.00.00.00

Application Promoter: Arecom Inc
Product Sponsor Arecom Inc
Counterparty-guarantor
Regulator I.T.T.

Order ID (if app.) 52037465
Conf.date/time (if app.) 94.05.01.14.30.50.00
Contract/Product context: 1 of 1

Valuations as at 94.06.01.15.00.00.00

	F.P.V's	Contract
Expected Value	10.2501	54.236
Std. Deviation	0.022	5.207

Special Deal Type: Ordering party negative entitlement allowed

FIG. 57B

AS AT 31.05.01.55.00.00.00 Report for: Tamer1

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
Notional Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,100	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

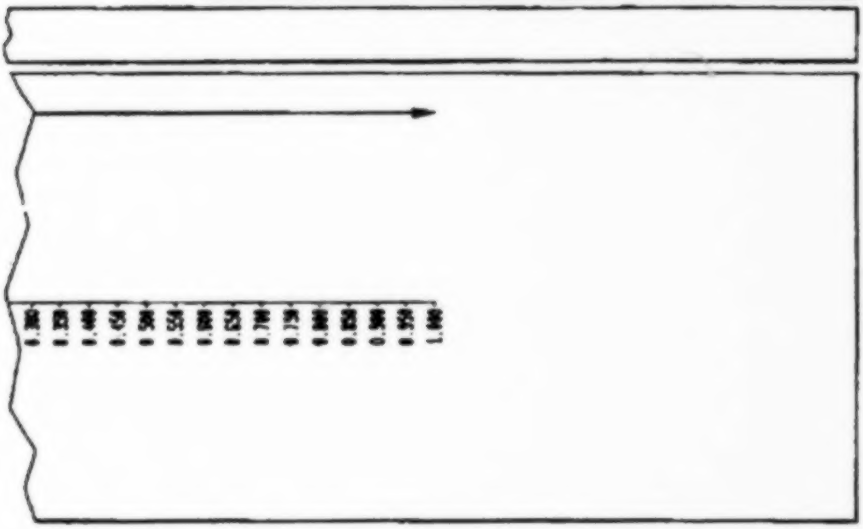
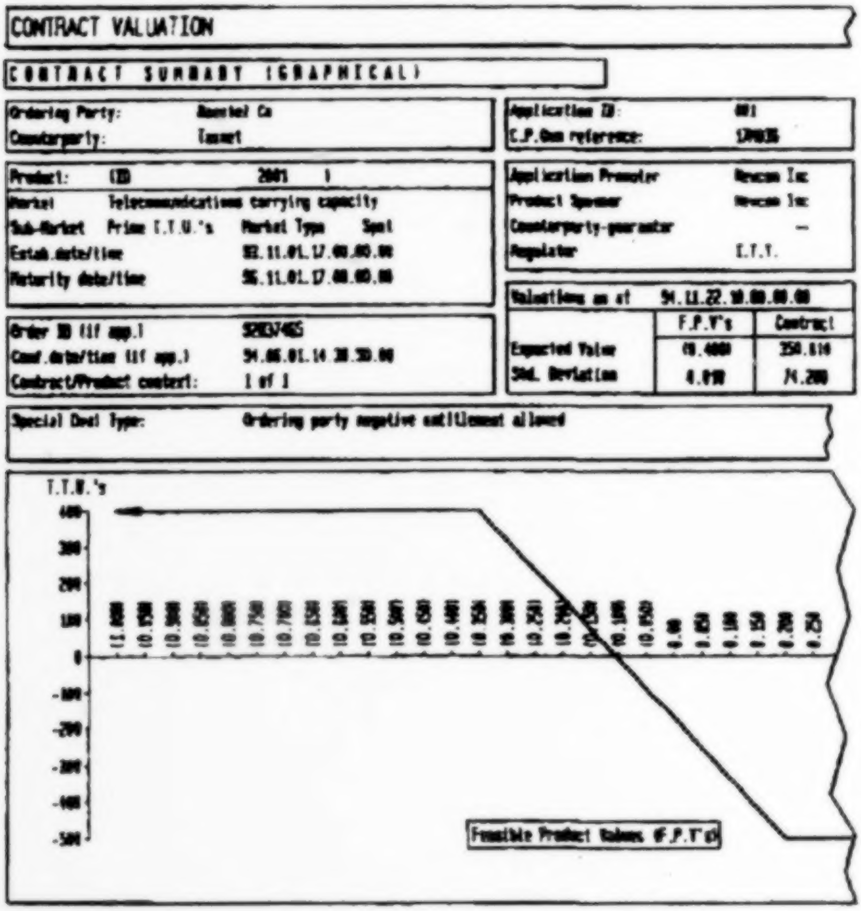


FIG. 58A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Bentel Co
Counterparty:	Tasnet

Application ID:	001
C.P.Gen reference:	179015

Product: (ID) 2001 1

Market Telecommunications carrying capacity

Sub-Market Prime T.T.U.'s Market Type Spot

Estab.date/time 93.11.01.17.00.00.00

Maturity date/time 96.11.01.17.00.00.00

Application Promoter	Nexcom Inc
Product Sponsor	Nexcom Inc
Counterparty-guarantor	—
Regulator	I.T.Y.

Order ID (if app.)	52837465
Conf.date/time (if app.)	94.06.01.14.38.50.00
Contract/Product context:	1 of 1

Valuations as of 94.11.22.10.00.00.00

	F.P.V's	Contract
Expected Value	49.4000	250.610
Std. Deviation	4.090	74.200

Special Deal Type: Ordering party negative entitlement allowed

FIG. 58B

AS AT 94.11.22.10.00.00.00 Report for: Baseball Co

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55.100	As below

Pricing and Matching Process: Minimize consideration payout
under an EV/CE regime

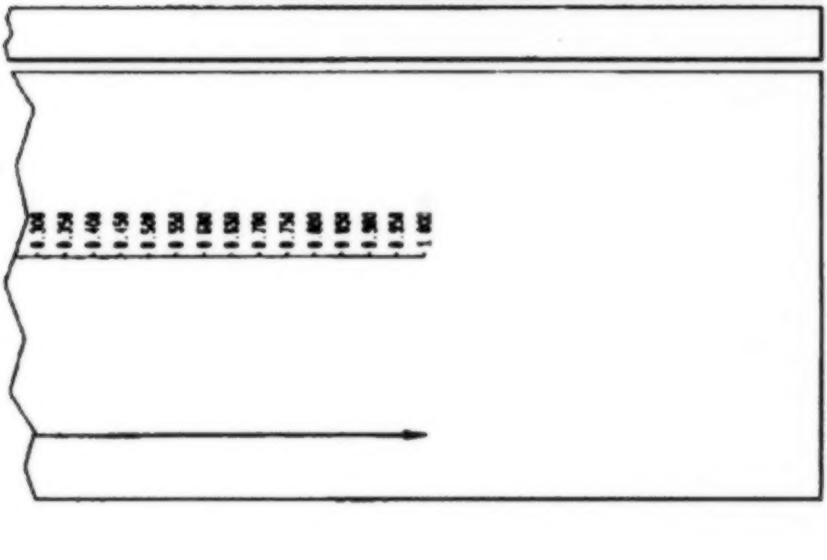
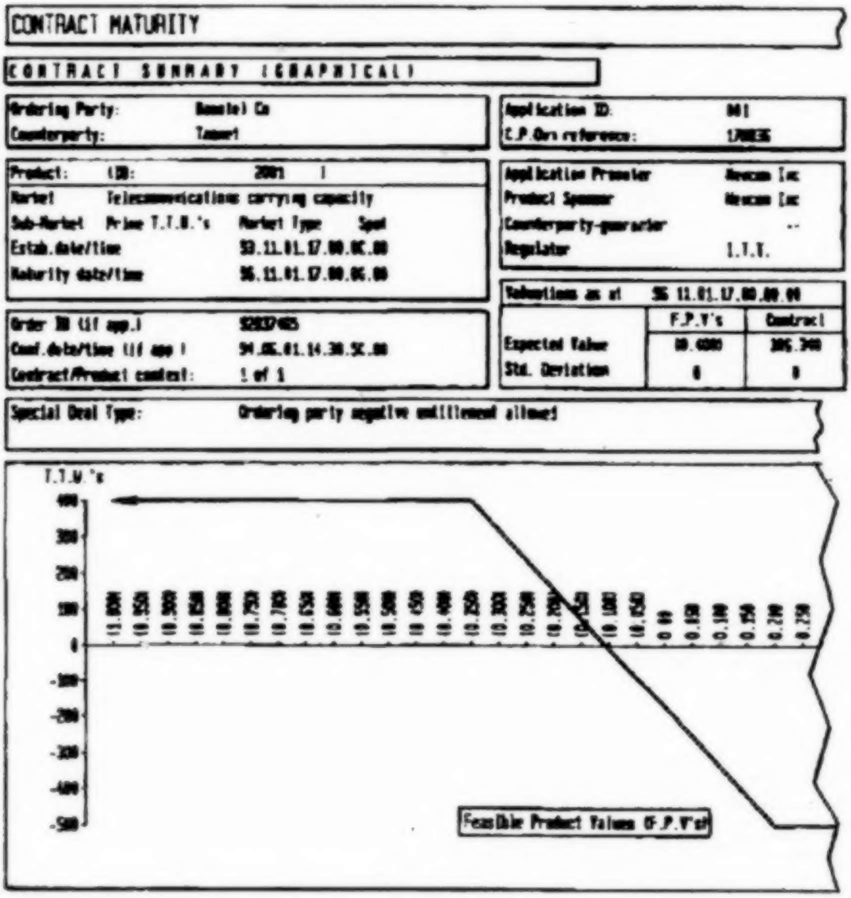

0.350
0.375
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 59A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bonntel Co
Counterparty: Tamert

Product: (ID: 2001)
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 93.11.01.17.00.00.00
Maturity date/time 96.11.01.17.00.06.00

Order ID (if app.) 92837465
Conf.date/time (if app.) 94.05.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 001
C.P.Ors reference: 170035

Application Promoter Amecom Inc
Product Sponsor Amecom Inc
Counterparty-guarantor --
Regulator I.T.T.

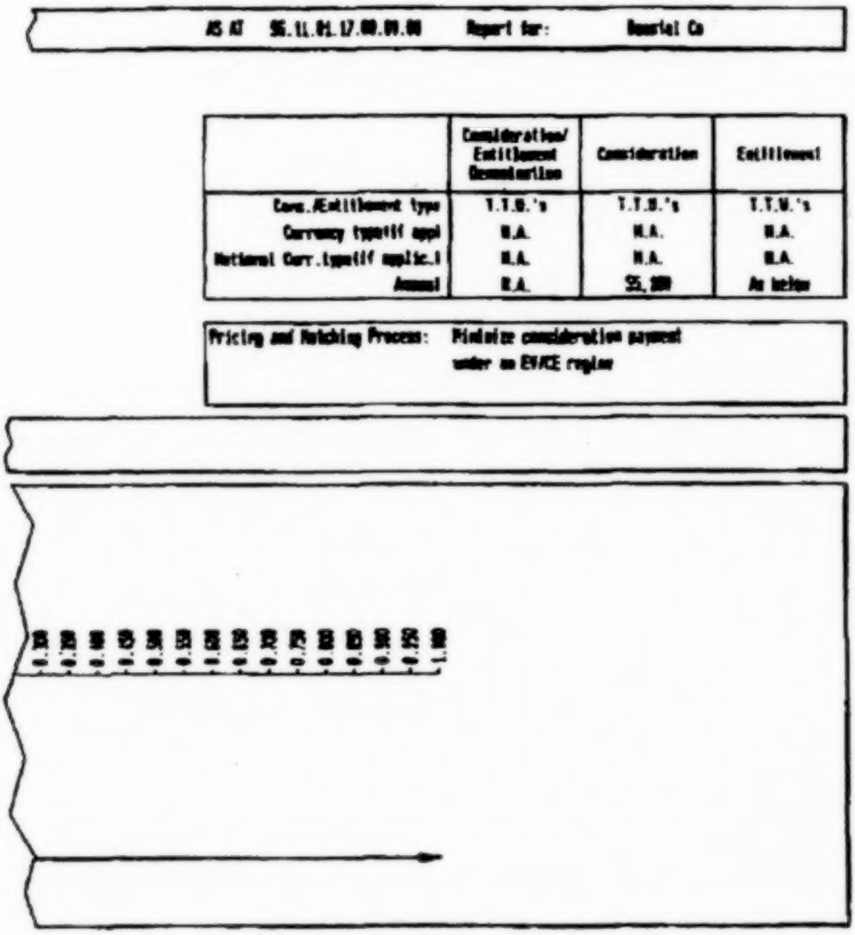
Valuations as at 96.11.01.17.00.00.00

	F.P.V's	Contract
Expected Value	80.4000	105.340
Std. Deviation	0	0

Special Deal Type: Ordering party negative entitlement allowed

T.T.U.'s
400
300
200
100
0
-100
-200
-300
-400
-500
(1.000)
(0.950)
(0.900)
(0.850)
(0.800)
(0.750)
(0.700)
(0.650)
(0.600)
(0.550)
(0.500)
(0.450)
(0.400)
(0.350)
(0.300)
(0.250)
(0.200)
(0.150)
(0.100)
(0.050)
0.00
0.050
0.100
0.150
0.200
0.250
Feasible Product Values (F.P.V's)

FIG. 59B

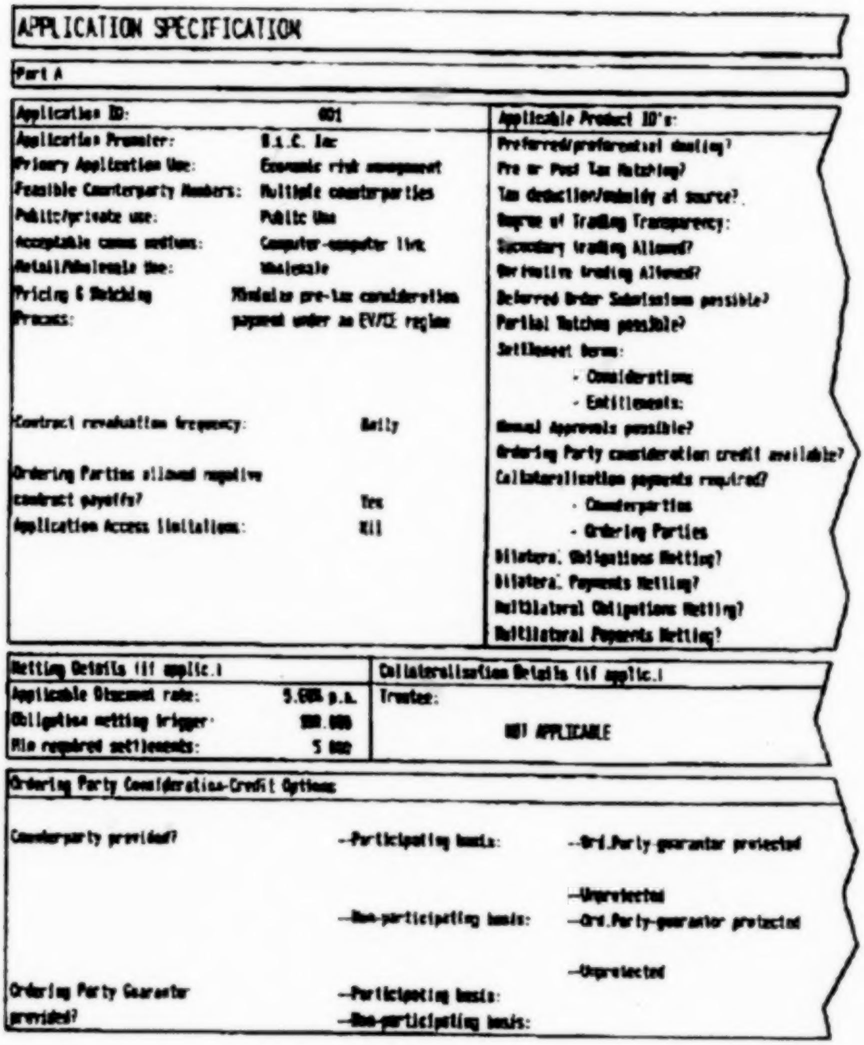


AS AT 95.11.01.17.00.00.00 Report for: Special Co

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
Notional Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	$5,000	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

FIG. 60A



APPLICATION SPECIFICATION

Part A

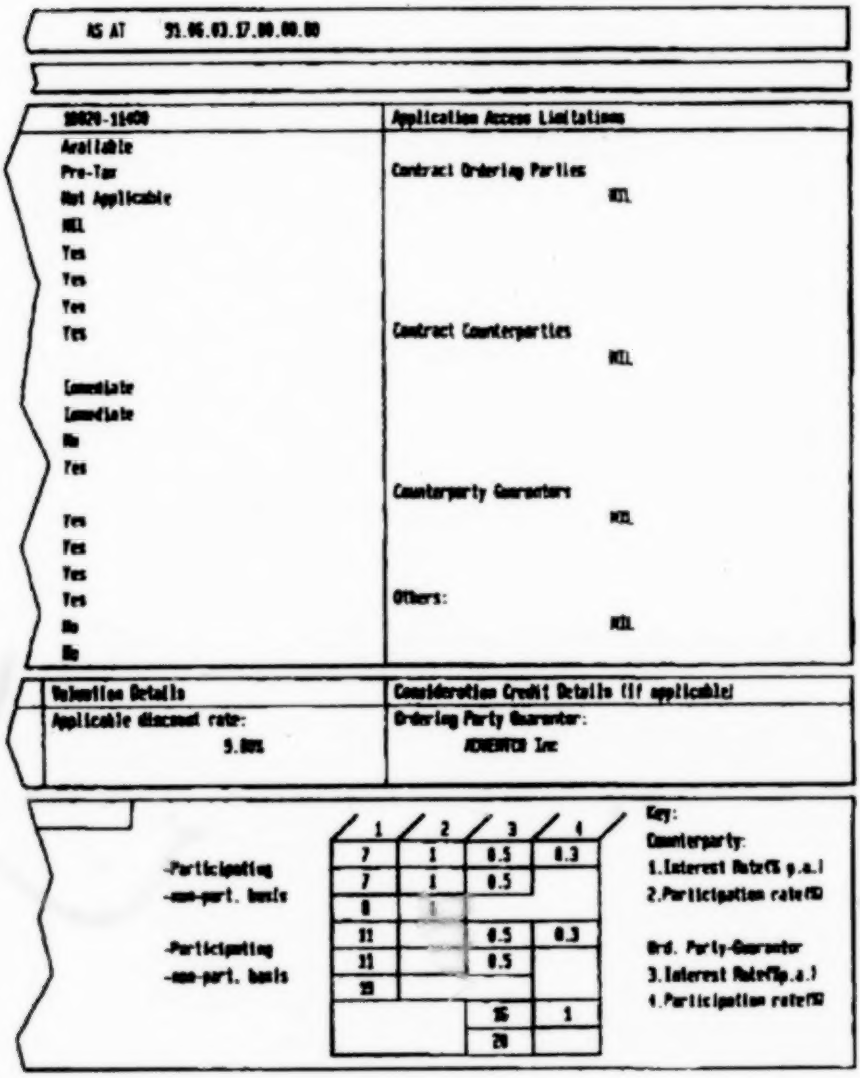
Application ID:	001	Applicable Product ID's:
Application Promoter:	B.i.C. Inc	Preferred/preferential dealing?
Primary Application Use:	Economic risk management	Pre or Post Tax Matching?
Feasible Counterparty Numbers:	Multiple counterparties	Tax deduction/subsidy at source?
Public/private use:	Public Use	Degree of Trading Transparency:
Acceptable comms mediums:	Computer-computer link	Secondary trading Allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading Allowed?
Pricing & Matching Process:	Minimize pre-tax consideration payment under an EV/CE regime	Deferred Order Submissions possible?
		Partial Matches possible?
		Settlement terms: - Considerations - Entitlements:
Contract revaluation frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit available?
Ordering Parties allowed negative contract payoffs?	Yes	Collateralisation payments required? - Counterparties - Ordering Parties
Application Access limitations:	Nil	Bilateral Obligations Netting?
		Bilateral Payments Netting?
		Multilateral Obligations Netting?
		Multilateral Payments Netting?

Netting Details (if applic.)		Collateralisation Details (if applic.)
Applicable Discount rate:	5.00% p.a.	Trustee:
Obligation netting trigger:	100.000	NOT APPLICABLE
Min required settlements:	5 000	

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating basis:	--Ord.Party-guarantor protected --Unprotected
	--Non-participating basis:	--Ord.Party-guarantor protected --Unprotected
Ordering Party Guarantor provided?	--Participating basis:	
	--Non-participating basis:	

FIG. 60B



AS AT 91.06.03.17.00.00.00

10020-11400	Application Access Limitations
Available Pre-Tax Not Applicable NIL Yes Yes Yes Yes Immediate Immediate No Yes Yes Yes Yes Yes No No	Contract Ordering Parties NIL Contract Counterparties NIL Counterparty Guarantors NIL Others: NIL

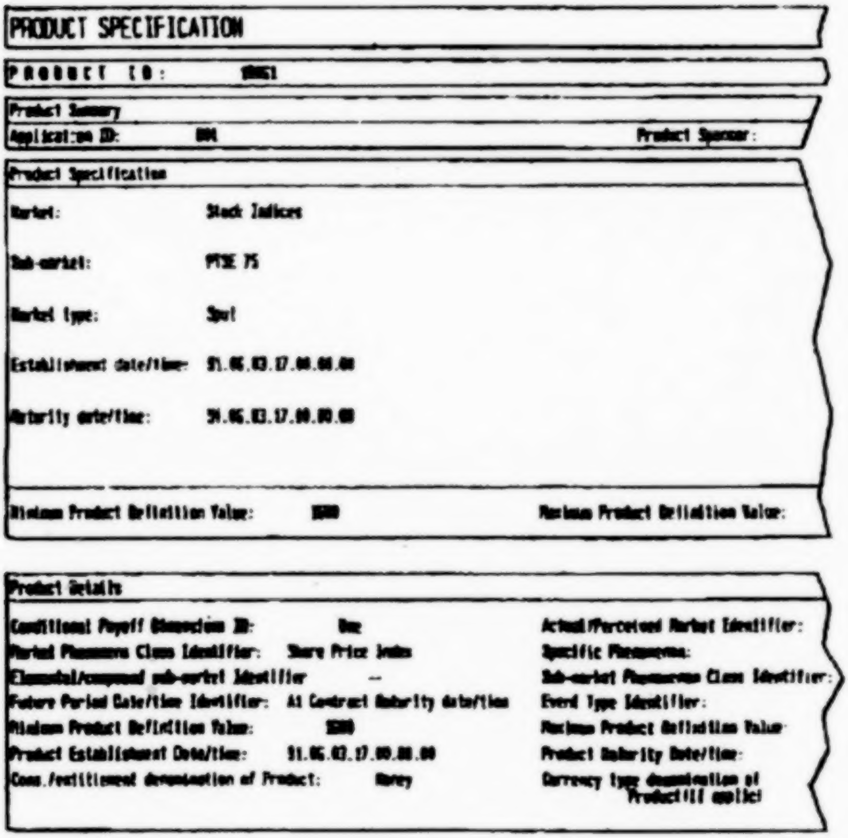
Valuation Details	Consideration Credit Details (if applicable)
Applicable discount rate: 9.00%	Ordering Party Guarantor: ACMEWATCH Inc

	1	2	3	4
	7	1	0.5	0.3
-Participating	7	1	0.5	
-non-part. basis	8	1		
	11		0.5	0.3
-Participating	11		0.5	
-non-part. basis	19			
			15	1
			20	

Key:
Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Ord. Party-Guarantor
3.Interest Rate(%p.a.)
4.Participation rate(%)

FIG. 61A



PRODUCT SPECIFICATION

PRODUCT ID: 10051

Product Summary

Application ID: 004

Product Sponsor:

Product Specification

Market: Stock Indices

Sub-market: FTSE 75

Market type: Spot

Establishment date/time: 91.06.03.17.00.00.00

Maturity date/time: 94.06.03.17.00.00.00

Minimum Product Definition Value: 1500

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimension ID: One

Market Phenomena Class Identifier: Share Price Index

Elemental/compound sub-market Identifier —

Future Period Date/time Identifier: At Contract Maturity date/time

Minimum Product Definition Value: 1500

Product Establishment Date/time: 91.06.03.17.00.00.00

Cons./entitlement denomination of Product: Money

Actual/Perceived Market Identifier:

Specific Phenomena:

Sub-market Phenomena Class Identifier:

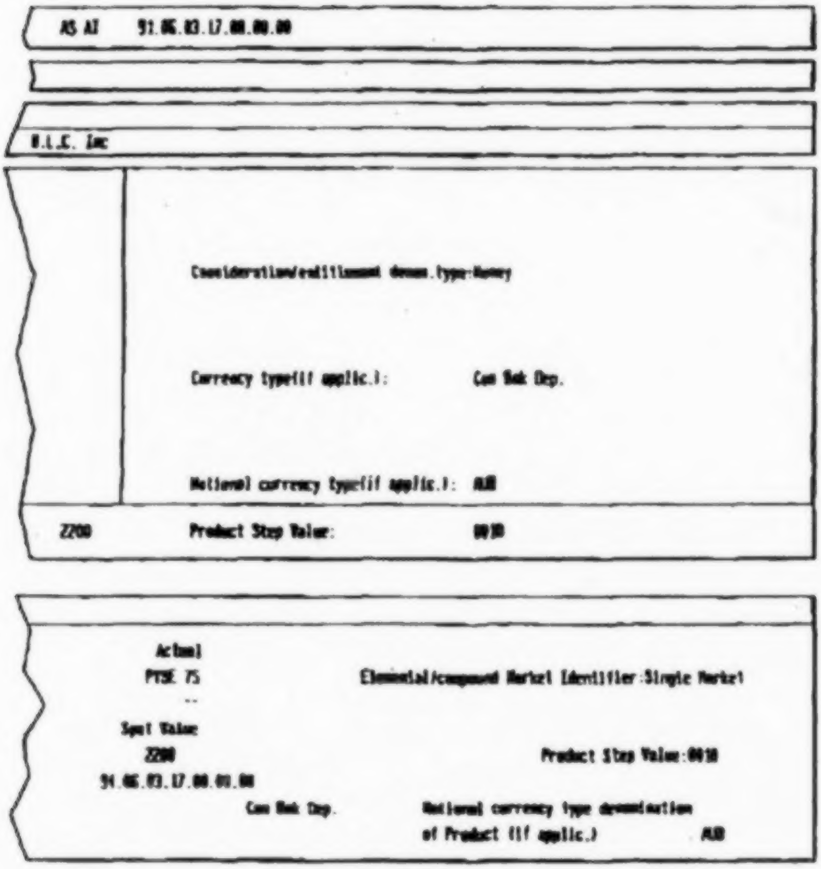
Event Type Identifier:

Maximum Product Definition Value:

Product Maturity Date/time:

Currency type denomination of Product(if applic)

FIG. 61B



AS AT 91.06.03.17.00.00.00

W.L.C. Inc

Consideration/entitlement denom.type:Money

Currency type(if applic.): Cen Bnk Dep.

National currency type(if applic.): AUD

2200 Product Step Value: 0010

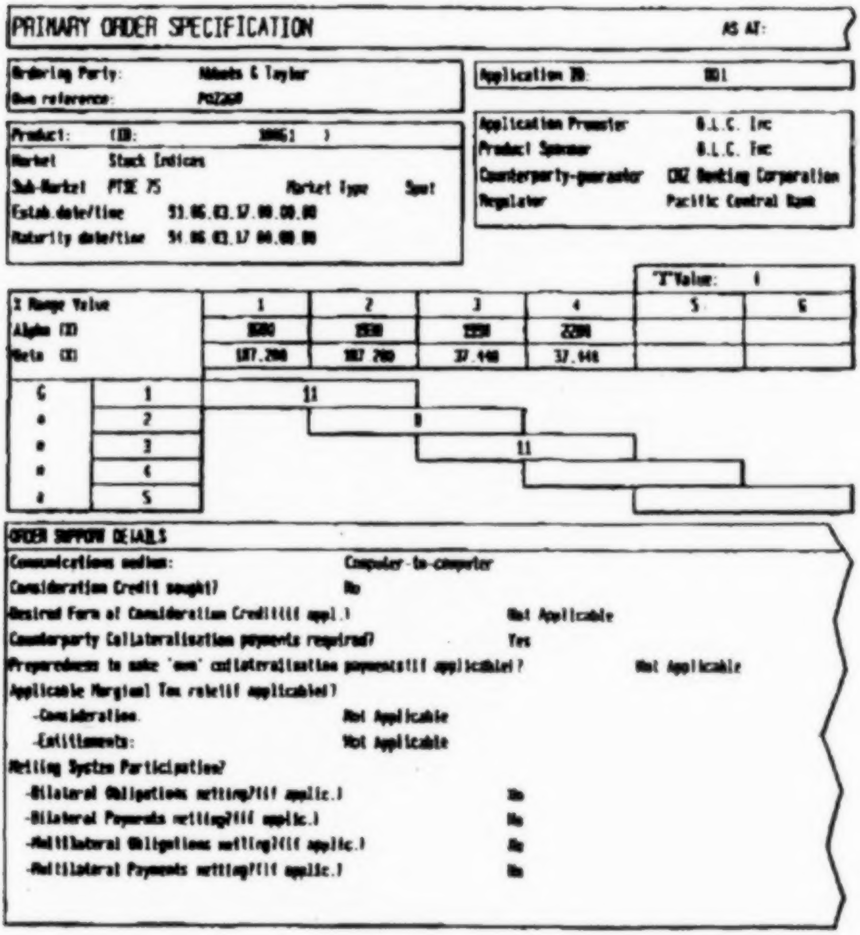
Actual
NYSE 75
--
Spot Value
2200
91.06.03.17.00.01.00
Cen Bnk Dep.

Elemental/compound Market Identifier:Single Market

Product Step Value:0010

National currency type denomination of Product (if applic.) AUD

FIG. 62A



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: Abbots & Taylor
Own reference: PO2260

Application ID: 001

Product: (ID: 10051)
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab.date/time 93.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CNZ Banking Corporation
Regulator Pacific Central Bank

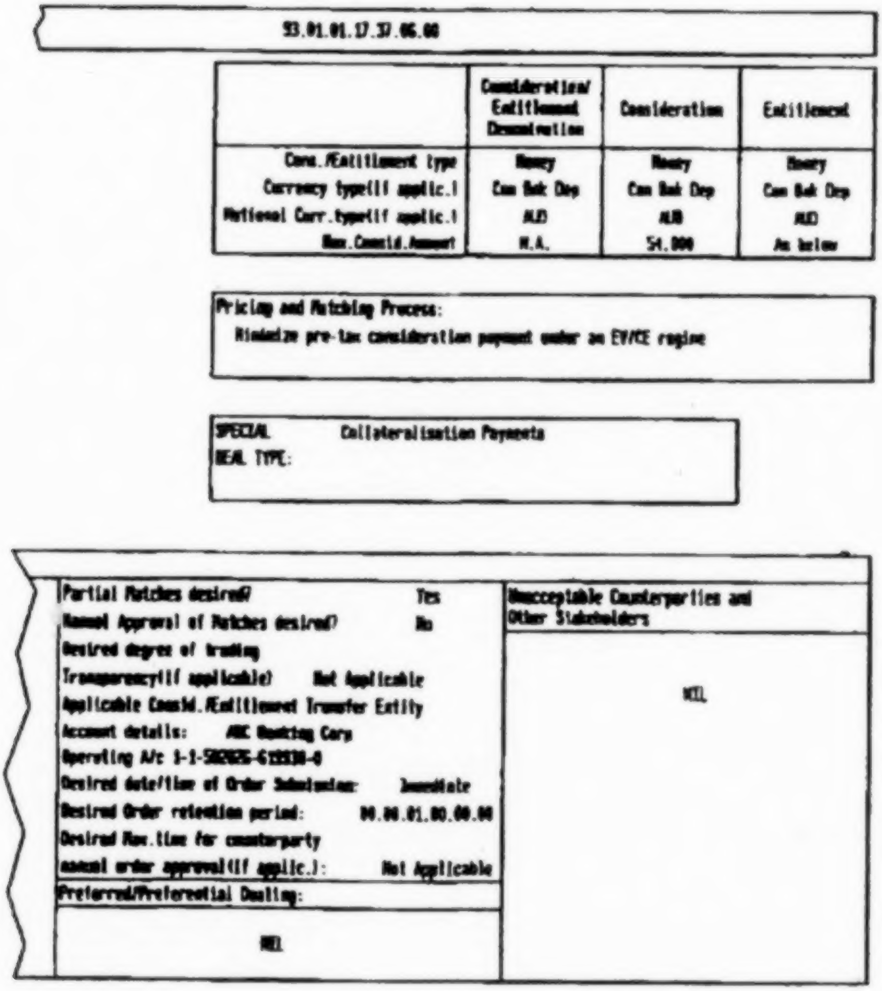
"J" Value: 1

X Range Value	1	2	3	4	5	6
Alpha (X)	1600	1850	1950	2200		
Beta (X)	187.200	187.200	37.440	37.440		

G	1	11
a	2	8
m	3	11
m	4	
a	5	

ORDER SUPPORT DETAILS
Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralization payments required? Yes
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration. Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 62B



93.01.01.17.37.06.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	54,000	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an EV/CE regime

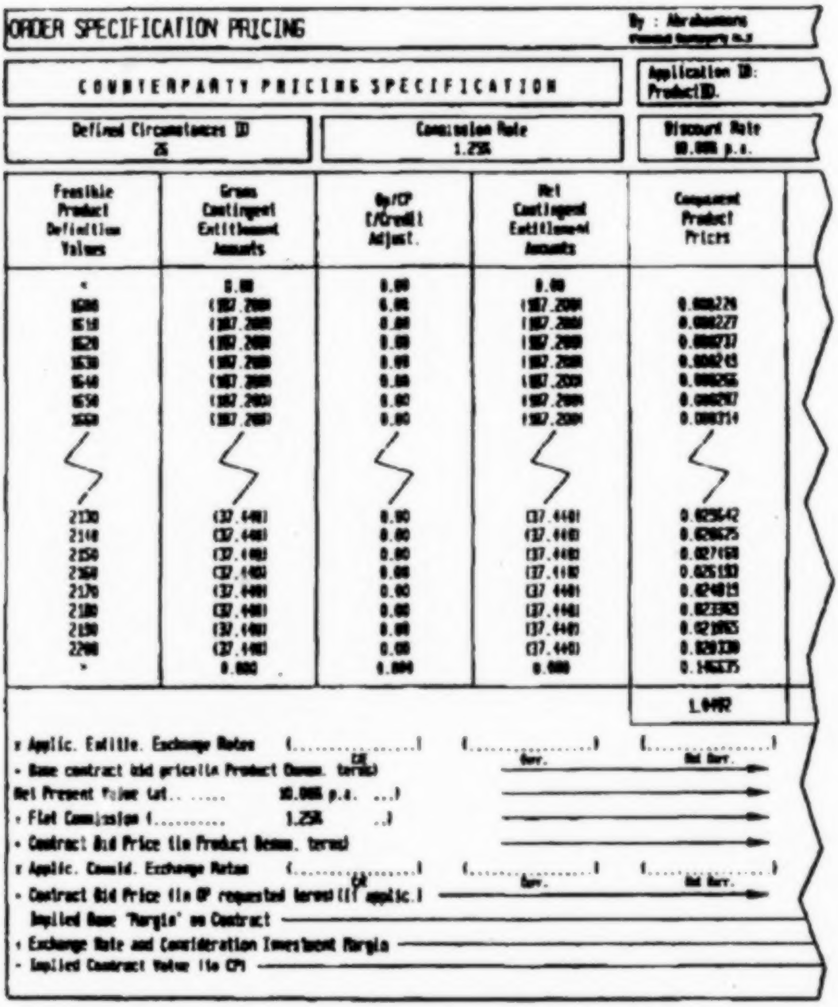
SPECIAL DEAL TYPE: Collateralisation Payments

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity Account details: ABC Banking Corp Operating A/c 1-1-502025-613330-0
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty manual order approval(if applic.): Not Applicable

Preferred/Preferential Dealing:
NIL

Unacceptable Counterparties and Other Stakeholders
NIL

FIG. 63A



ORDER SPECIFICATION PRICING

By : Abrahamsons
[illegible]

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID.

Defined Circumstances ID
25

Commission Rate
1.25%

Discount Rate
10.00% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP (/Credit) Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
<	0.00	0.00	0.00	
1600	(187.2000)	0.00	(187.2000)	0.000226
1610	(187.2000)	0.00	(187.2000)	0.000227
1620	(187.2000)	0.00	(187.2000)	0.000237
1630	(187.2000)	0.00	(187.2000)	0.000245
1640	(187.2000)	0.00	(187.2000)	0.000256
1650	(187.2000)	0.00	(187.2000)	0.000287
1660	(187.2000)	0.00	(187.2000)	0.000314
2130	(37.4400)	0.00	(37.4400)	0.029642
2140	(37.4400)	0.00	(37.4400)	0.028675
2150	(37.4400)	0.00	(37.4400)	0.027168
2160	(37.4400)	0.00	(37.4400)	0.026193
2170	(37.4400)	0.00	(37.4400)	0.024815
2180	(37.4400)	0.00	(37.4400)	0.023385
2190	(37.4400)	0.00	(37.4400)	0.021965
2200	(37.4400)	0.00	(37.4400)	0.020330
>	0.000	0.000	0.000	0.146635
				1.0492

x Applic. Entitle. Exchange Rates (...............) (...............) (...............)

CE Curr. Bid Curr.

= Base contract bid price(in Product Denom. terms)

Net Present Value (at........ 10.00% p.a. ...)

+ Flat Commission (.......... 1.25% ..)

= Contract Bid Price (in Product Denom. terms)

x Applic. Consid. Exchange Rates (...............) (...............) (...............)

CR Curr. Bid Curr.

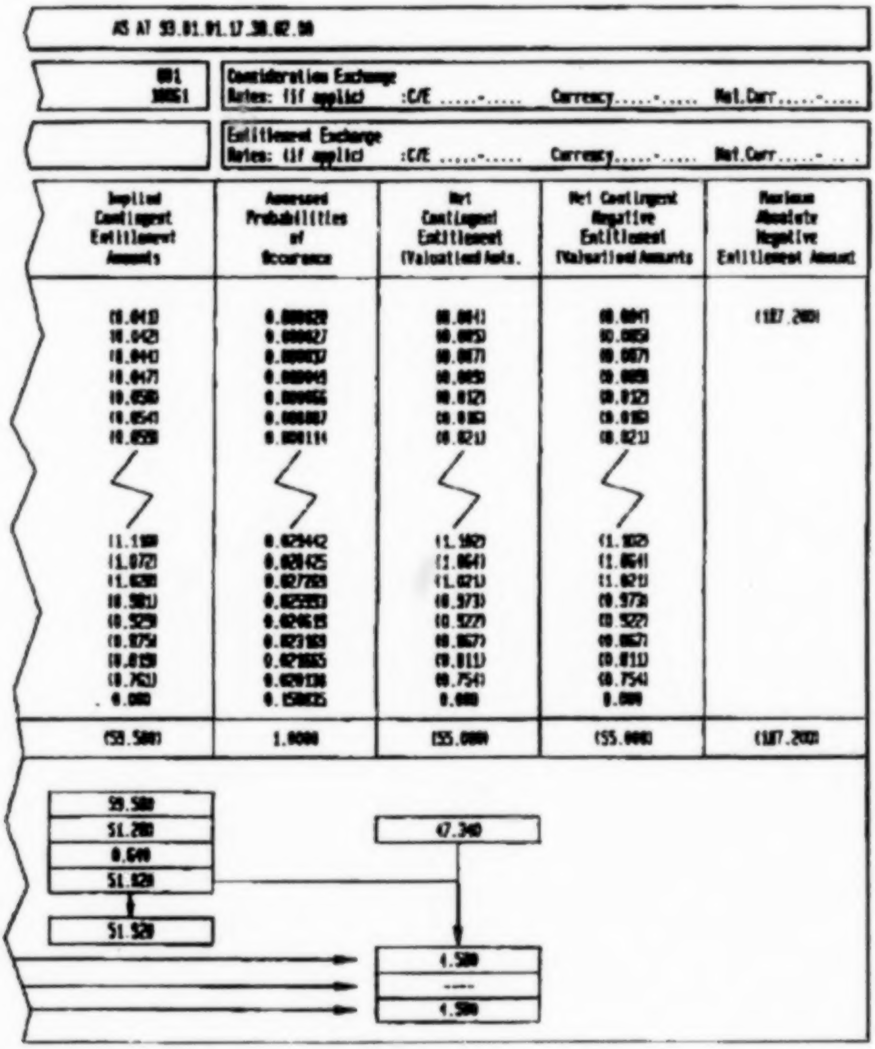
= Contract Bid Price (in CP requested terms)(if applic.)

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

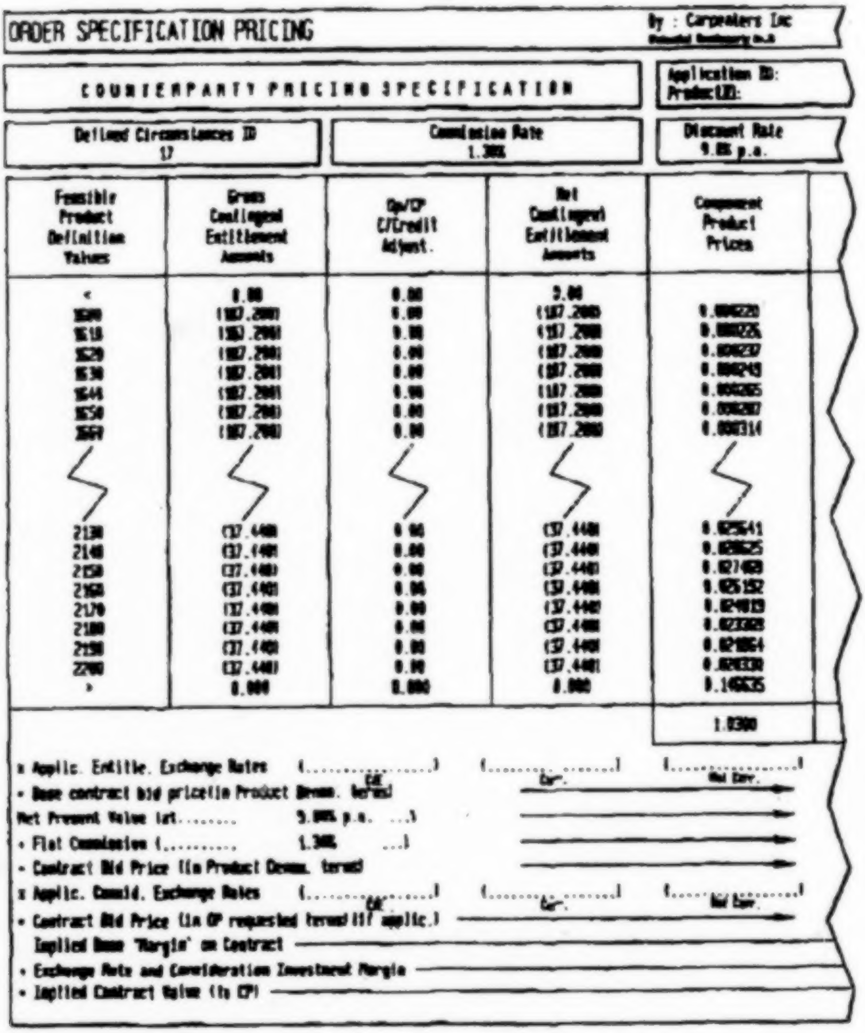
= Implied Contract Value (to CP)

FIG. 63B


AS AT 93.01.01.17.30.02.90
001
10051
Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....
Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....
Implied Contingent Entitlement Amounts
Assessed Probabilities of Occurrence
Net Contingent Entitlement (Valuation) Amts.
Net Contingent Negative Entitlement (Valuation) Amounts
Maximum Absolute Negative Entitlement Amount
(0.041)
(0.042)
(0.044)
(0.047)
(0.050)
(0.054)
(0.059)
(1.100)
(1.072)
(1.030)
(0.981)
(0.929)
(0.875)
(0.819)
(0.762)
0.000
(59.500)
0.000029
0.000027
0.000037
0.000046
0.000066
0.000087
0.000114
0.029442
0.028425
0.027289
0.025993
0.024615
0.023183
0.021665
0.020138
0.150835
1.0000
(0.004)
(0.005)
(0.007)
(0.009)
(0.012)
(0.016)
(0.021)
(1.102)
(1.064)
(1.021)
(0.973)
(0.922)
(0.867)
(0.811)
(0.754)
0.000
(55.000)
(0.004)
(0.005)
(0.007)
(0.009)
(0.012)
(0.016)
(0.021)
(1.102)
(1.064)
(1.021)
(0.973)
(0.922)
(0.867)
(0.811)
(0.754)
0.000
(55.000)
(107.200)
(107.200)
59.500
51.280
0.640
51.920
51.920
47.340
4.580

4.580

FIG. 64A



ORDER SPECIFICATION PRICING

By : Carpenters Inc
[illegible]

COUNTERPARTY PRICING SPECIFICATION

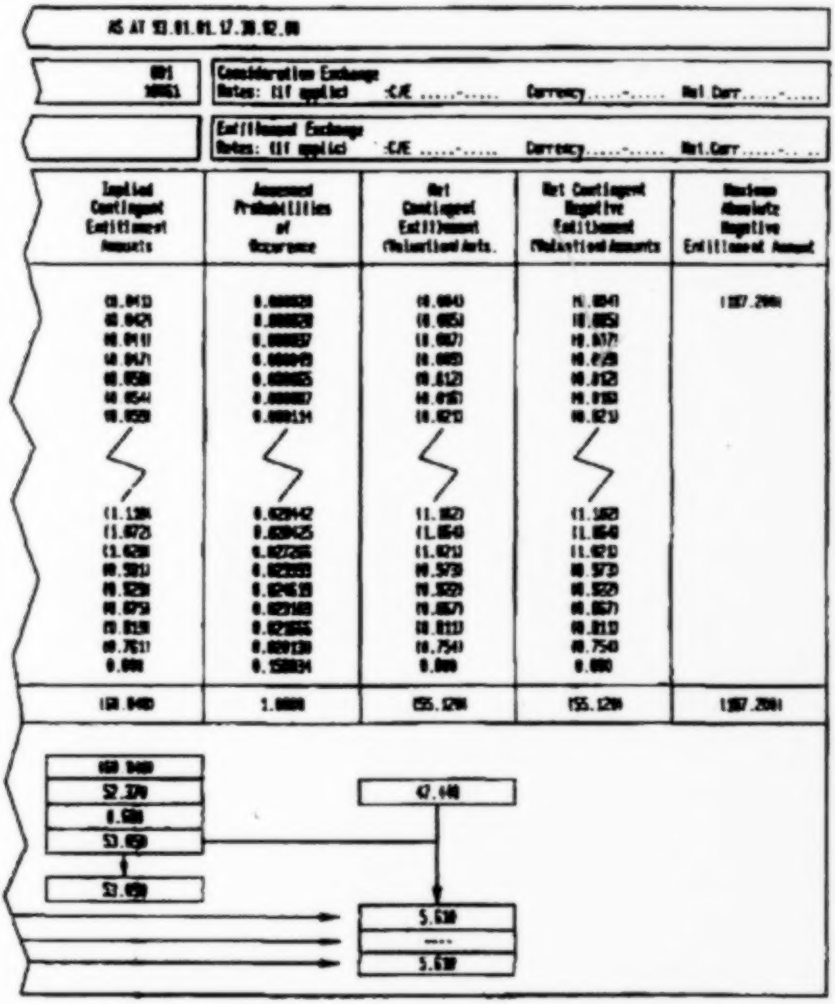
Application ID:
Product ID:

Defined Circumstances ID	Commission Rate	Discount Rate
17	1.30%	9.0% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Cp/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
<	0.00	0.00	0.00	
1500	(187.200)	0.00	(187.200)	0.000220
1510	(187.200)	0.00	(187.200)	0.000226
1520	(187.200)	0.00	(187.200)	0.000237
1530	(187.200)	0.00	(187.200)	0.000249
1540	(187.200)	0.00	(187.200)	0.000265
1550	(187.200)	0.00	(187.200)	0.000287
1560	(187.200)	0.00	(187.200)	0.000314
2130	(37.440)	0.00	(37.440)	0.025641
2140	(37.440)	0.00	(37.440)	0.028625
2150	(37.440)	0.00	(37.440)	0.027489
2160	(37.440)	0.00	(37.440)	0.025152
2170	(37.440)	0.00	(37.440)	0.024019
2180	(37.440)	0.00	(37.440)	0.023328
2190	(37.440)	0.00	(37.440)	0.021864
2200	(37.440)	0.00	(37.440)	0.020330
>	0.000	0.000	0.000	0.149635
				1.0300

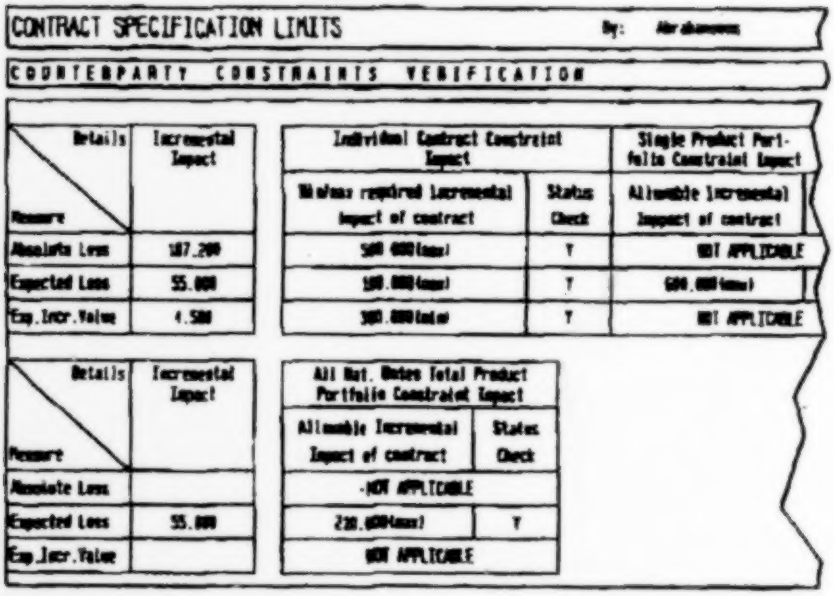
x Applic. Entitle. Exchange Rates (..................) (..................) (..................)
[illegible] Cur. Ref Cur.
= Base contract bid price(in Product Denom. terms)
Net Present Value (at........ 9.00% p.a. ...)
+ Flat Commission (.......... 1.30% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (..................) (..................) (..................)
[illegible] Cur. Ref Cur.
= Contract Bid Price (in CP requested terms)(if applic.)
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (to CP)

FIG. 64B


AS AT 93.01.01.17.30.02.00
001
10051
Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat Curr.....-.....
Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....
Implied Contingent Entitlement Amounts
Assessed Probabilities of Occurrence
Net Contingent Entitlement (Valuation) Amts.
Net Contingent Negative Entitlement (Valuation) Amounts
Maximum Absolute Negative Entitlement Amount
(187.200)
(60.040)
1.0000
(55.120)
(55.120)
(187.200)
60.040
52.370
0.580
53.650
53.650
47.440
5.610

5.610

FIG. 65A



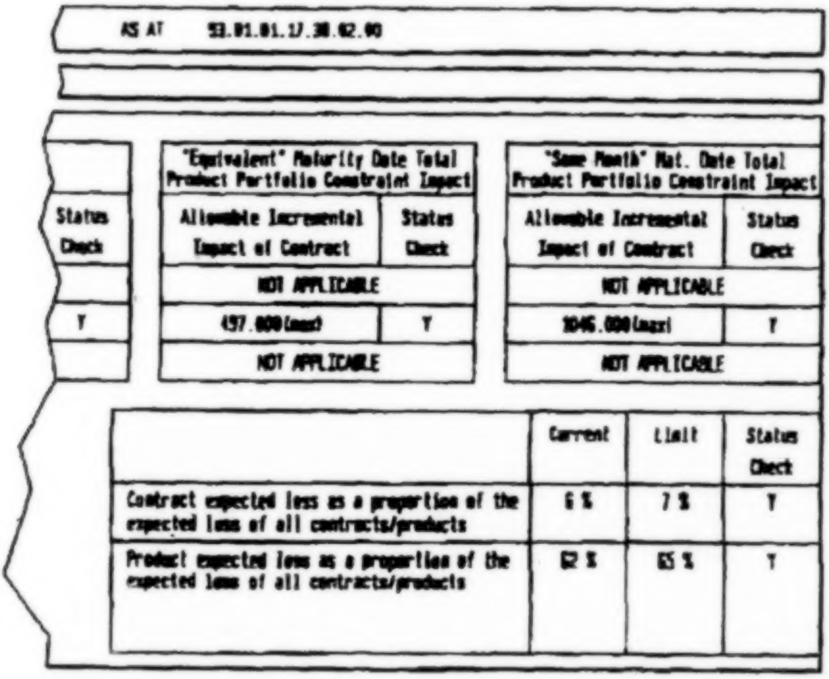
CONTRACT SPECIFICATION LIMITS By: [illegible]

COUNTERPARTY CONSTRAINTS VERIFICATION

Details / Measure	Incremental Impact	Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
		Min/max required Incremental Impact of contract	Status Check	Allowable Incremental Impact of contract
Absolute Loss	187.200	500.000(max)	Y	NOT APPLICABLE
Expected Loss	55.000	100.000(max)	Y	600.000(max)
Exp.Incr.Value	4.500	300.000(min)	Y	NOT APPLICABLE

Details / Measure	Incremental Impact	All Nat. Unites Total Product Portfolio Constraint Impact	
		Allowable Incremental Impact of contract	Status Check
Absolute Loss		-NOT APPLICABLE	
Expected Loss	55.000	220.000(max)	Y
Exp.Incr.Value		NOT APPLICABLE	

FIG. 65B

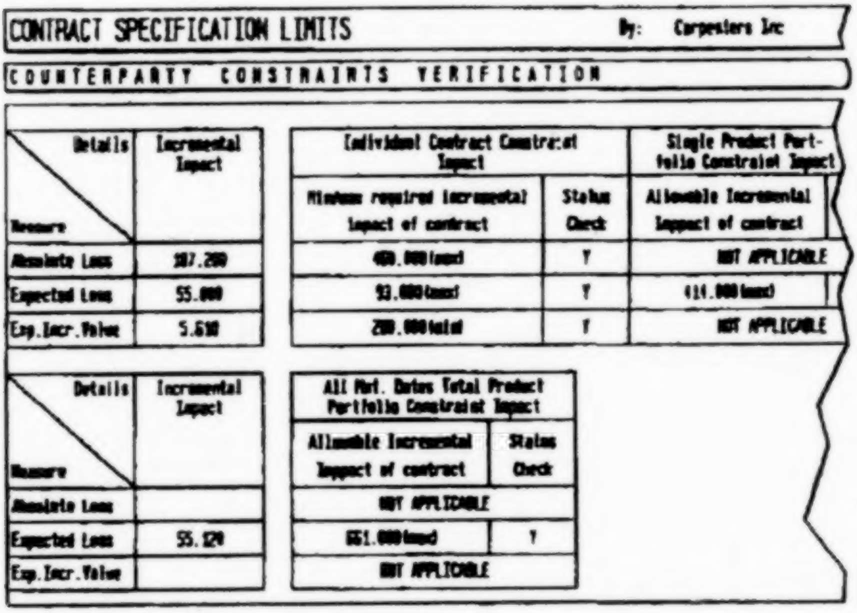


AS AT 93.01.01.17.30.02.00

	"Equivalent" Maturity Date Total Product Portfolio Constraint Impact		"Same Month" Mat. Date Total Product Portfolio Constraint Impact	
Status Check	Allowable Incremental Impact of Contract	Status Check	Allowable Incremental Impact of Contract	Status Check
	NOT APPLICABLE		NOT APPLICABLE	
Y	457.000(max)	Y	1046.000(max)	Y
	NOT APPLICABLE		NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	6 %	7 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	62 %	65 %	Y

FIG. 66A



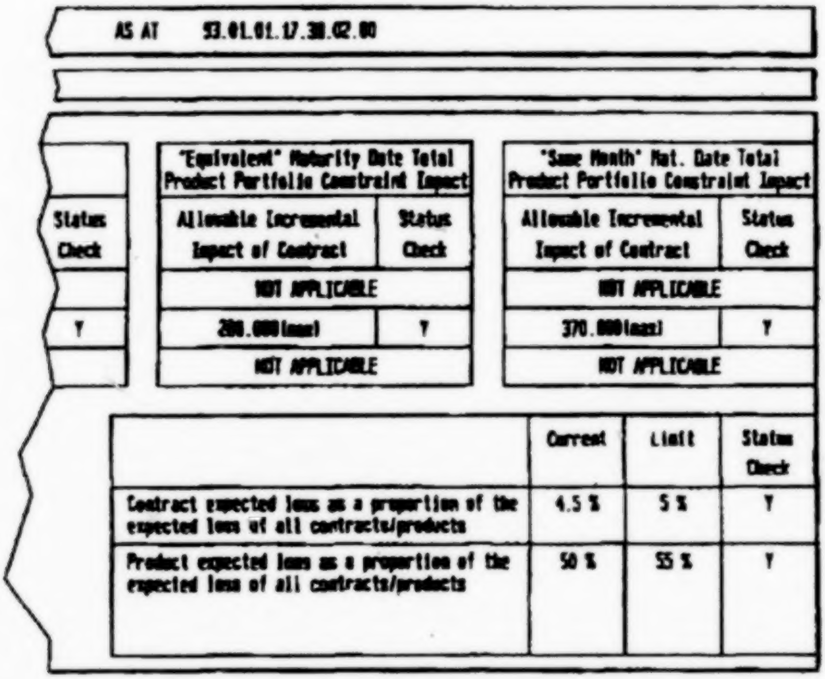
CONTRACT SPECIFICATION LIMITS By: Carpenters Inc

COUNTERPARTY CONSTRAINTS VERIFICATION

Details / Measure	Incremental Impact	Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
		Minimum required incremental impact of contract	Status Check	Allowable Incremental Imppact of contract
Absolute Loss	107.280	400.000(max)	Y	NOT APPLICABLE
Expected Loss	55.000	93.000(max)	Y	114.000(max)
Exp.Incr.Value	5.610	200.000(min)	Y	NOT APPLICABLE

Details / Measure	Incremental Impact	All Port. Dates Total Product Portfolio Constraint Impact	
		Allowable Incremental Imppact of contract	Status Check
Absolute Loss		NOT APPLICABLE	
Expected Loss	55.120	651.000(max)	Y
Exp.Incr.Value		NOT APPLICABLE	

FIG. 66B

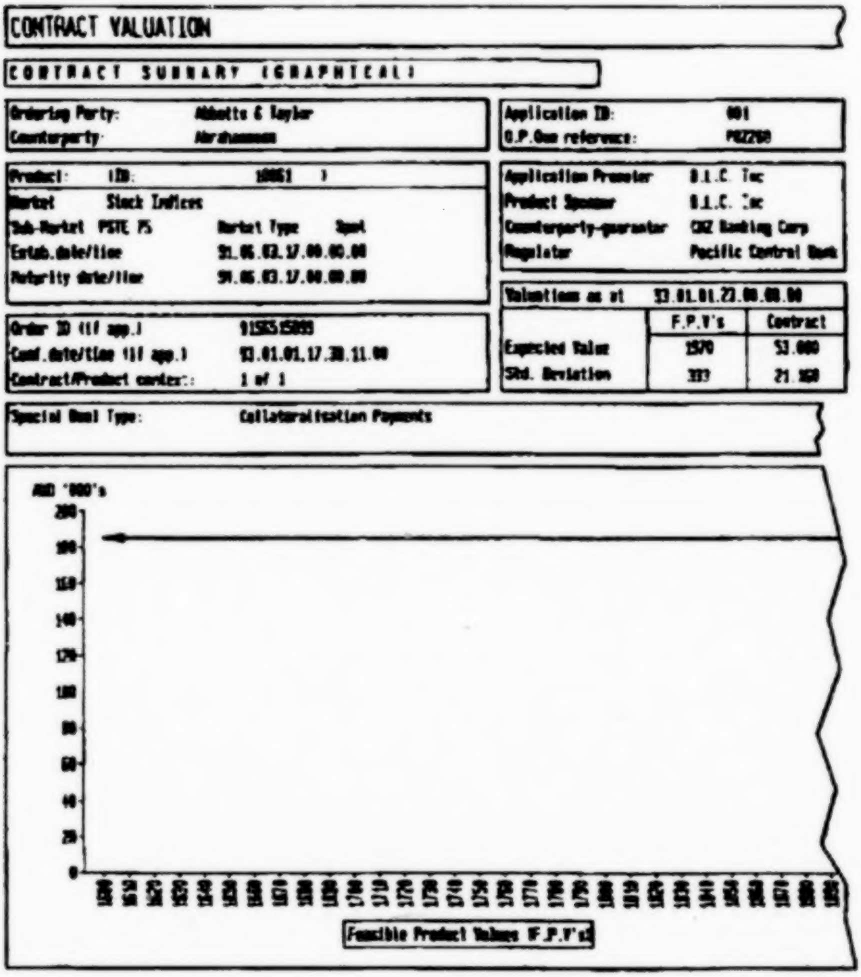


AS AT 93.01.01.17.30.02.00

		"Equivalent" Maturity Date Total Product Portfolio Constraint Impact		"Same Month" Mat. Date Total Product Portfolio Constraint Impact	
Status Check		Allowable Incremental Impact of Contract	Status Check	Allowable Incremental Impact of Contract	Status Check
		NOT APPLICABLE		NOT APPLICABLE	
Y		200.000(max)	Y	370.000(max)	Y
		NOT APPLICABLE		NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	4.5 %	5 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	50 %	55 %	Y

FIG. 67A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Abbotts & Taylor
Counterparty: Abrahamsson

Application ID: 001
O.P.Own reference: P02250

Product: (ID: 10061)
Market Stock Indices
Sub-Market FSTE 75 Market Type Spot
Estab.date/time 91.05.03.17.00.00.00
Maturity date/time 94.05.03.17.00.00.00

Application Promoter B.I.C. Inc
Product Sponsor B.I.C. Inc
Counterparty-guarantor CBZ Banking Corp
Regulator Pacific Central Bank

Order ID (if app.) 91565 15009
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product counter: 1 of 1

Valuations as at 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1570	53.000
Std. Deviation	333	21.160

Special Deal Type: Collateralisation Payments

FIG. 67B

AS AT: 93.01.01.23.00.00.00 Report for: Abbotts & Taylor

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	51,520	As below

Pricing and Matching Process:

Minimize pre-tax consideration payment under an EV/CE regime

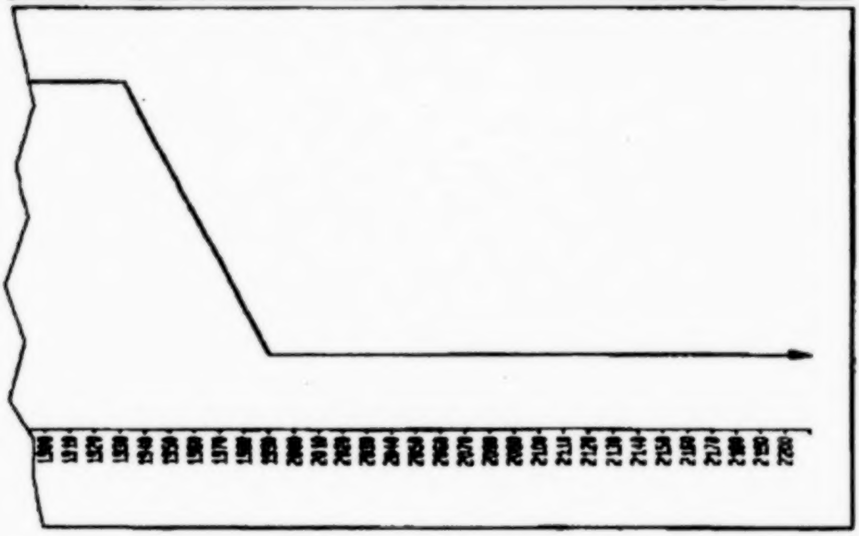
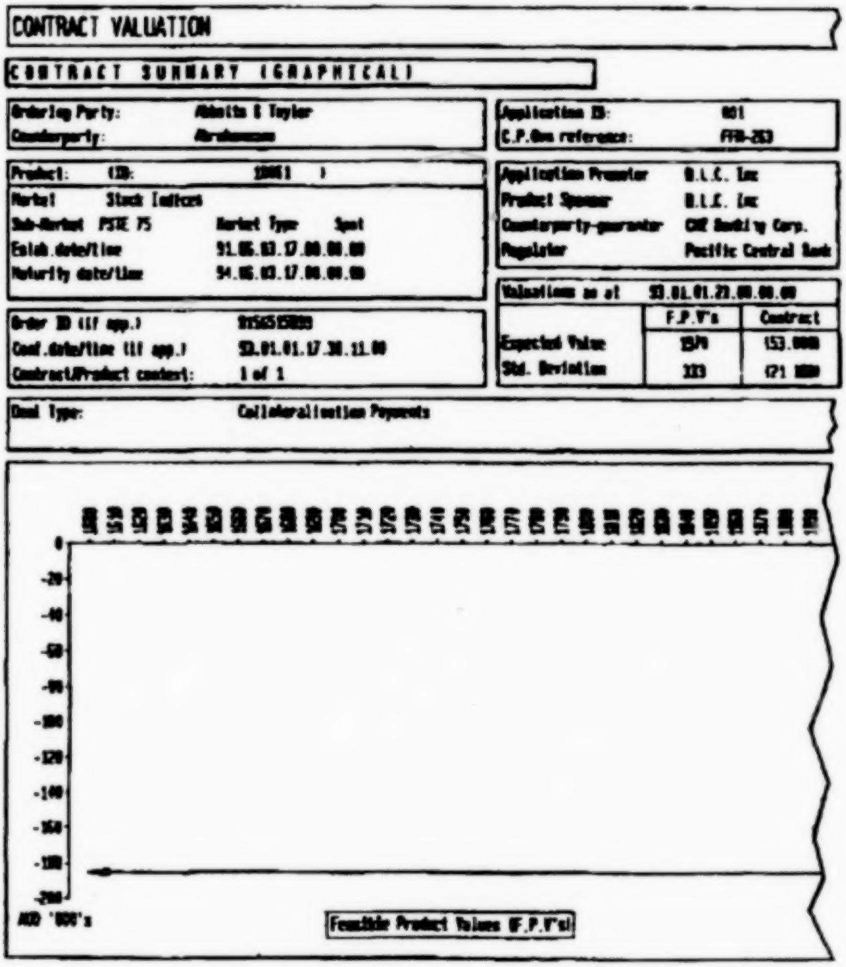


FIG. 68A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Abbotts & Taylor
Counterparty: Abrahamson

Product: (ID: 10061)
Market Stock Indices
Sub-Market FSTE 75 Market Type Spot
Estab. date/time 91.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Order ID (if app.) 9156515899
Conf. date/time (if app.) 93.01.01.17.30.11.00
Contract/Product content: 1 of 1

Deal Type: Collateralisation Payments

Application ID: 001
C.P.Own reference: FFB-253

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CHZ Banking Corp.
Regulator Pacific Central Bank

Valuations as at 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1579	153.000
Std. Deviation	333	(71 000)

FIG. 68B

AS AT 53.01.01.23.00.00.00 Report for: Abrahamsons

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	51,520	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EY/CE regime

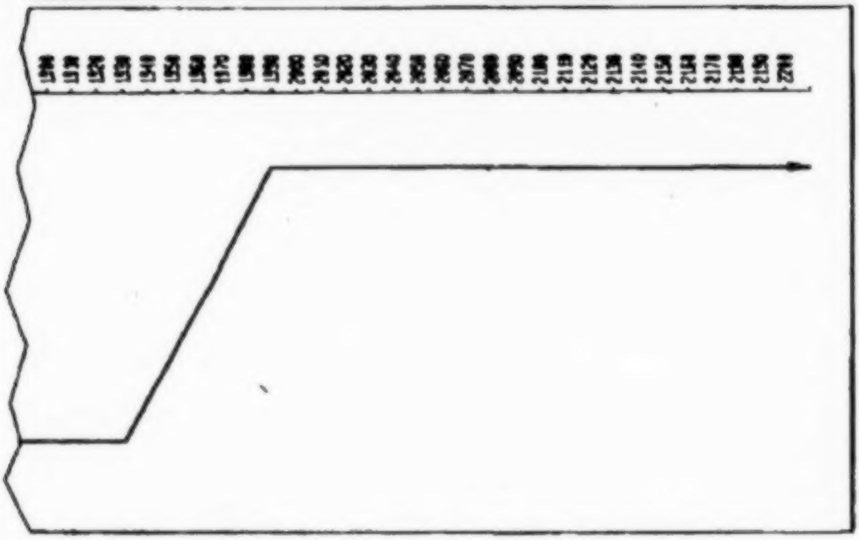
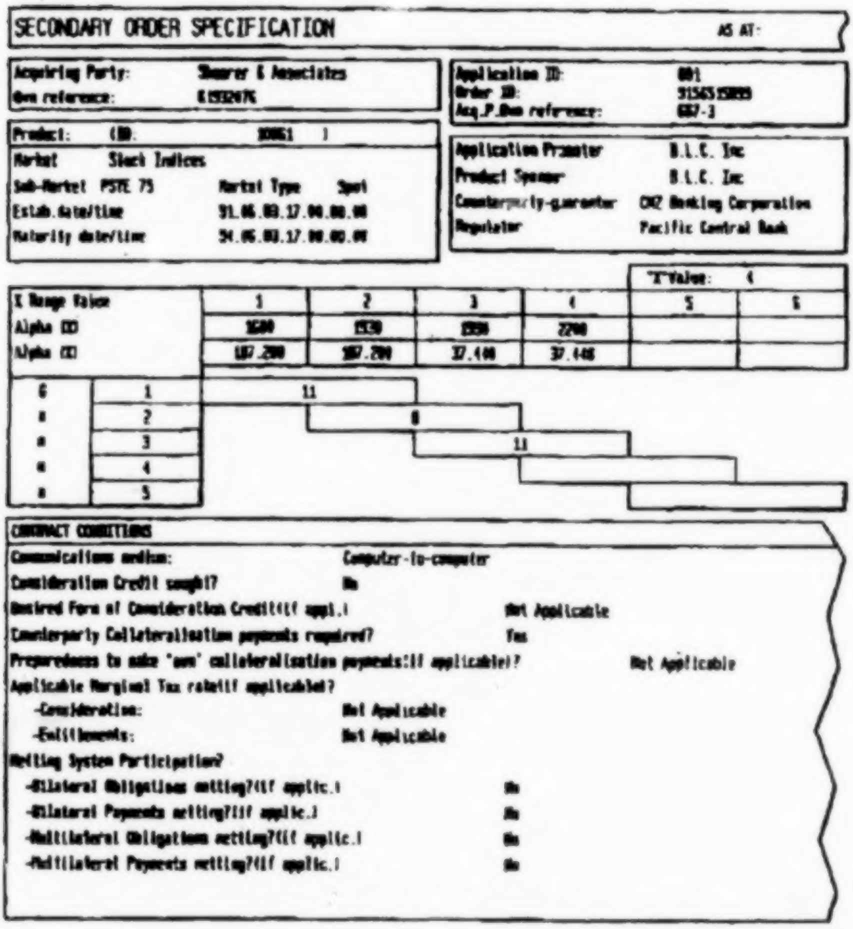


FIG. 69A



SECONDARY ORDER SPECIFICATION AS AT:

Acquiring Party:	Shearer & Associates
Own reference:	61592076
Application ID:	001
Order ID:	3156315095
Acq.P.Own reference:	007-3

Product: (ID: 10061)

Market	Stock Indices		
Sub-Market	PSTE 75	Market Type	Spot
Estab.date/time		91.06.03.17.00.00.00	
Maturity date/time		94.06.03.17.00.00.00	

Application Promoter	B.L.C. Inc
Product Sponsor	B.L.C. Inc
Counterparty-guarantor	CKZ Banking Corporation
Regulator	Pacific Central Bank

"X" Value: 4

X Range Value		1	2	3	4	5	6
Alpha (X)		1500	1930	1950	2200		
Alpha (X)		107.200	107.200	37.400	37.440		
G	1	11					
r	2		8				
o	3			11			
u	4						
p	5						

CONTRACT CONDITIONS

Communications medium: Computer-to-computer

Consideration Credit sought? No

Desired Form of Consideration Credit(if appl.) Not Applicable

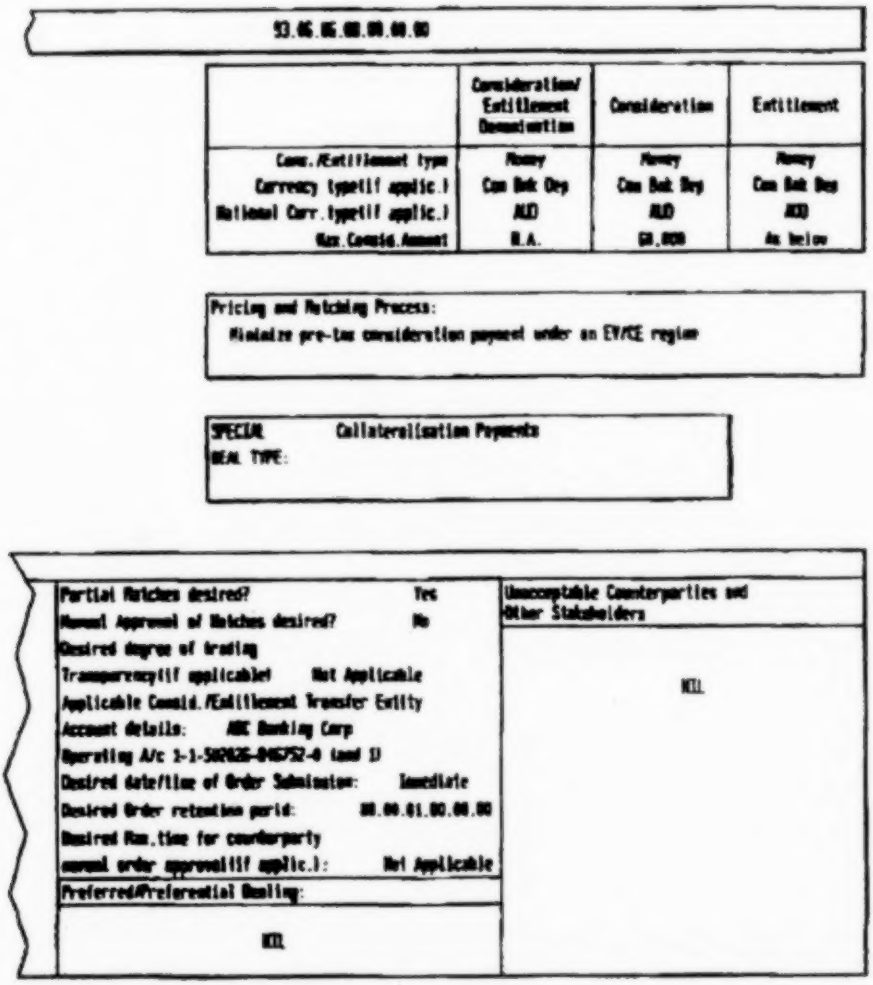
Counterparty Collateralisation payments required? Yes

Preparedness to make "own" collateralisation payments:(if applicable)? Not Applicable

Applicable Marginal Tax rate(if applicable)?
- Consideration: Not Applicable
- Entitlements: Not Applicable

Netting System Participation?
- Bilateral Obligations netting?(if applic.) No
- Bilateral Payments netting?(if applic.) No
- Multilateral Obligations netting?(if applic.) No
- Multilateral Payments netting?(if applic.) No

FIG. 69B



93.06.06.00.00.00.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr. type(if applic.)	AUD	AUD	AUD
Max. Consid. Amount	N.A.	60,000	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an EV/CE regime

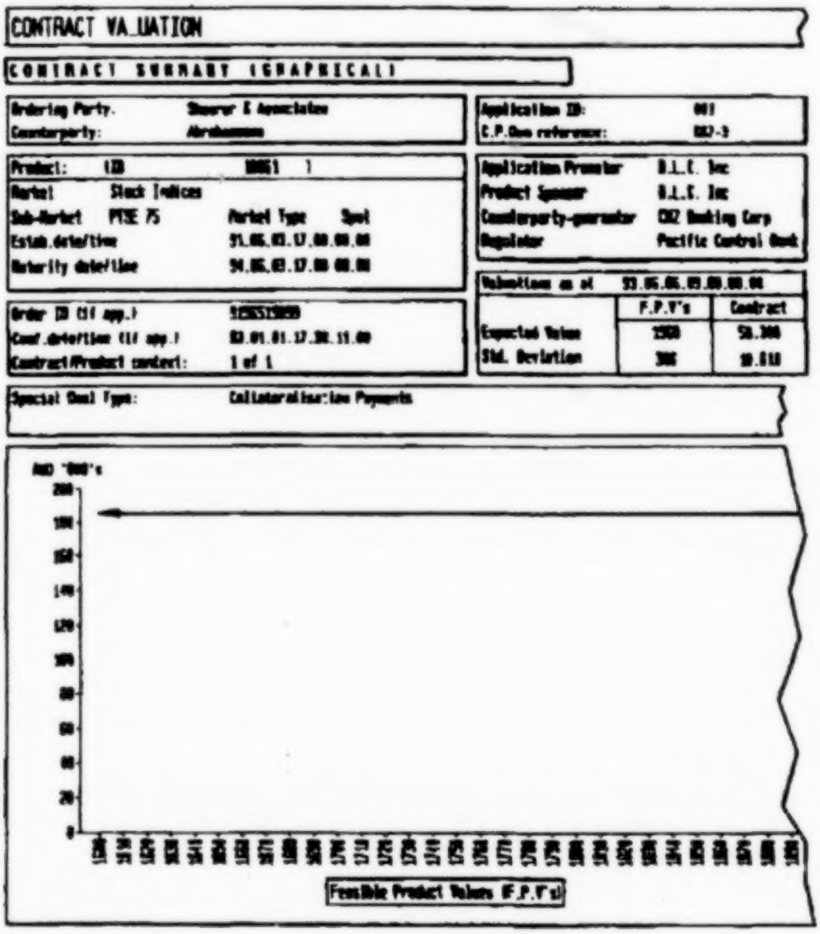
SPECIAL Collateralisation Payments
DEAL TYPE:

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading
Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-502026-046752-0 (and 1)
Desired date/time of Order Submission: Immediate
Desired Order retention perid: 00.00.01.00.00.00
Desired Max. time for counterparty
manual order approval(if applic.): Not Applicable

Preferred/Preferential Dealing:
NIL

Unacceptable Counterparties and
Other Stakeholders
NIL

FIG. 70A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Shearer & Associates
Counterparty:	Abrahamsson

Application ID:	001
C.P.Own reference:	007-3

Product: LID 10061 1

Market	Stock Indices		
Sub-Market	FTSE 75	Market Type	Spot
Estab.date/time		91.05.03.17.00.00.00	
Maturity date/time		94.05.03.17.00.00.00	

Application Promoter	D.L.C. Inc
Product Sponsor	D.L.C. Inc
Counterparty-guarantor	CBZ Banking Corp
Regulator	Pacific Central Bank

Valuations as at 93.05.05.09.00.00.00

	F.P.V's	Contract
Expected Value	1500	58.300
Std. Deviation	306	10.010

Order ID (if app.)	5255515000
Conf.date/time (if app.)	93.01.01.17.30.11.00
Contract/Product context:	1 of 1

Special Deal Type: Collateralisation Payments

FIG. 70B

AS AT 93.06.06.05.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Con Bnk dep.	Con Bnk dep.	Con Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50,200	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

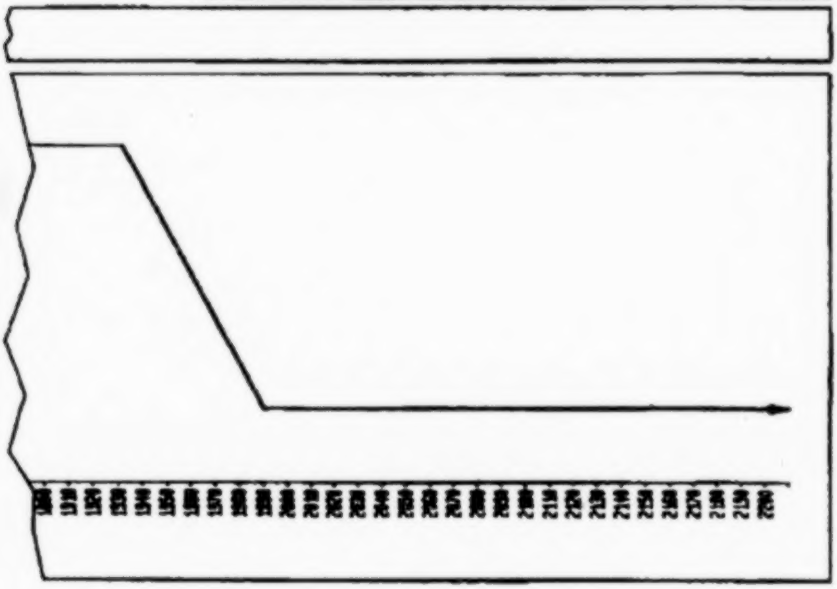
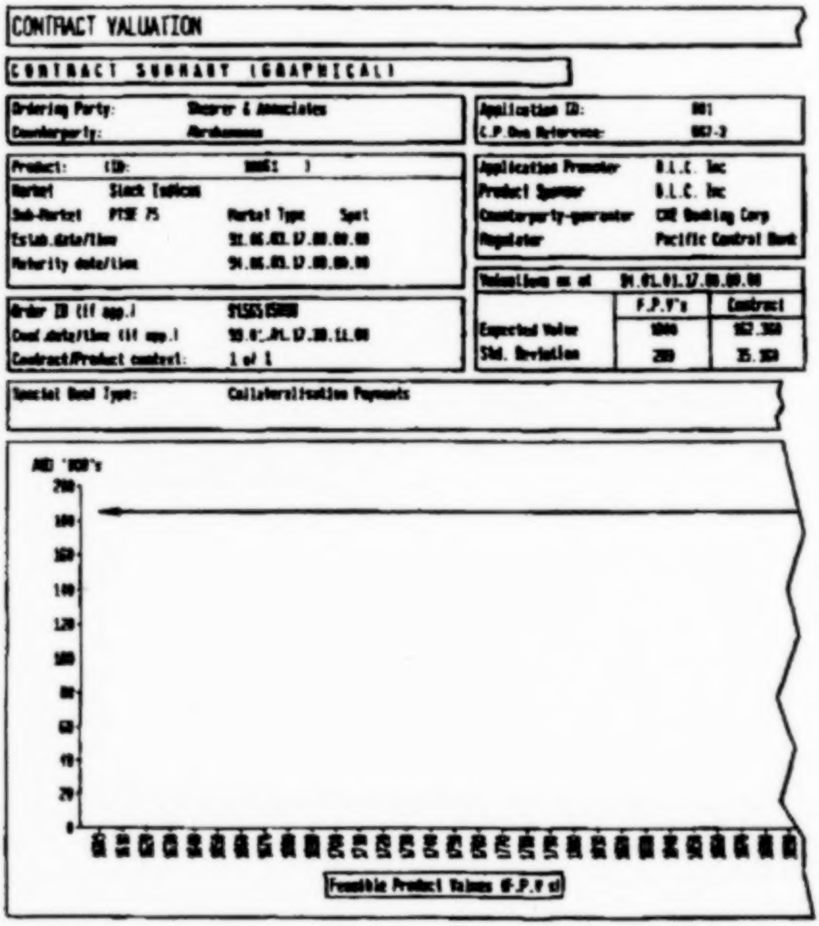


FIG. 71A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Shearer & Associates
Counterparty:	Abrahamson

Application ID:	001
C.P. Own Reference:	007-3

Product: (ID: 10061)

Market	Stock Indices		
Sub-Market	FTSE 75	Market Type	Spot
Estab. date/time		92.06.03.17.00.00.00	
Maturity date/time		94.06.03.17.00.00.00	

Application Promoter	B.L.C. Inc
Product Sponsor	B.L.C. Inc
Counterparty-guarantor	CHR Banking Corp
Regulator	Pacific Central Bank

Valuations as at 94.01.01.17.00.00.00

	F.P.V's	Contract
Expected Value	1000	162.350
Std. Deviation	200	35.350

Order ID (if app.)	9156515000
Conf. date/time (if app.)	93.01.01.17.30.11.00
Contract/Product context:	1 of 1

Special Deal Type: Collateralisation Payments

]

FIG. 71B

AS AT 94.01.01.17.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if app)	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50,000	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

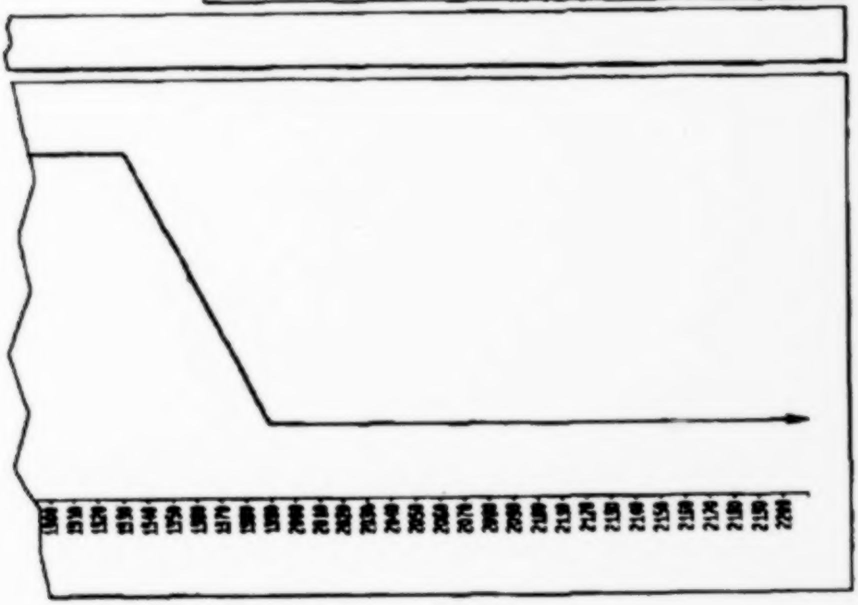
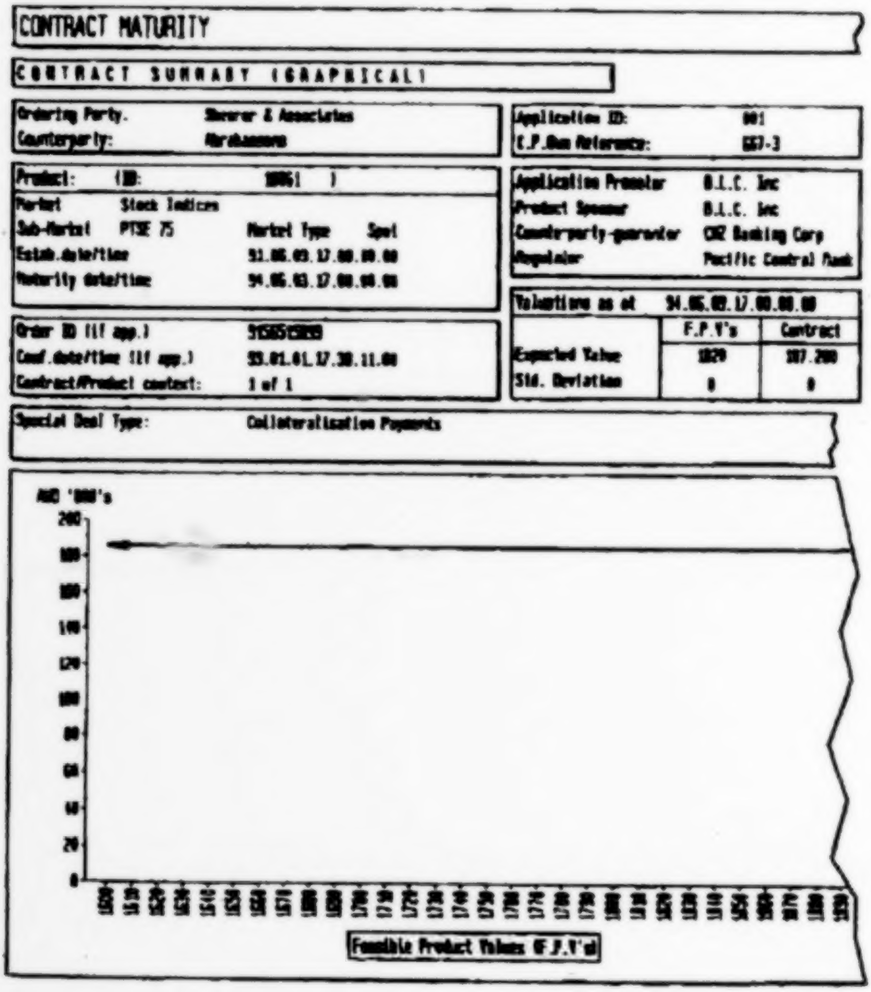


FIG. 72A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party. Shearer & Associates
Counterparty: Abrahamsons

Application ID: 001
C.P.Own Reference: 687-3

Product: (ID: 10061)
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab.date/time 93.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter B.I.C. Inc
Product Sponsor B.I.C. Inc
Counterparty-guarantor CBZ Banking Corp
Regulator Pacific Central Bank

Order ID (if app.) 9150515050
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product context: 1 of 1

Valuations as at 94.06.02.17.00.00.00

	F.P.V's	Contract
Expected Value	1829	187.200
Std. Deviation	0	0

Special Deal Type: Collateralisation Payments

FIG. 72B

AS AT 94.06.03.17.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Con Bnk dep.	Con Bnk dep.	Con Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50,300	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

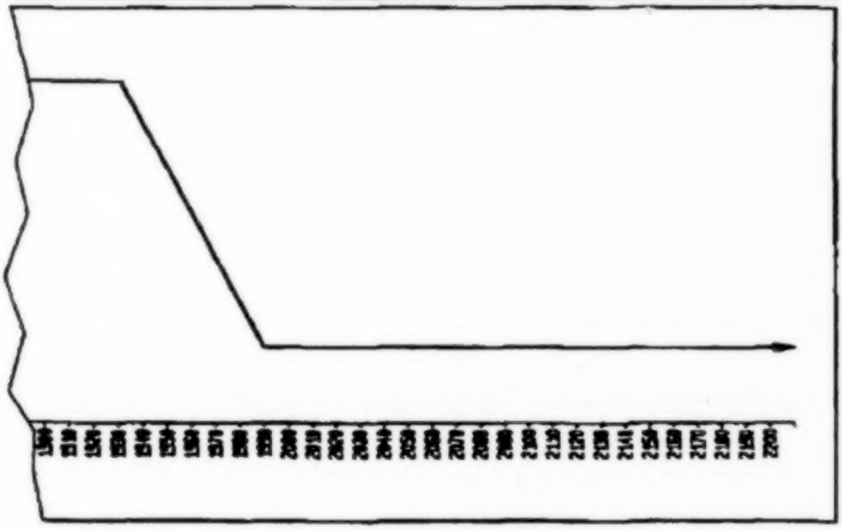
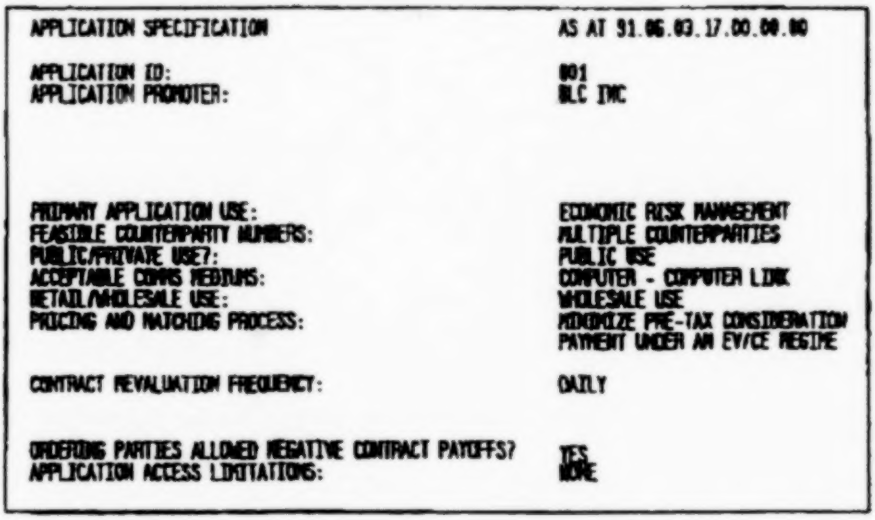
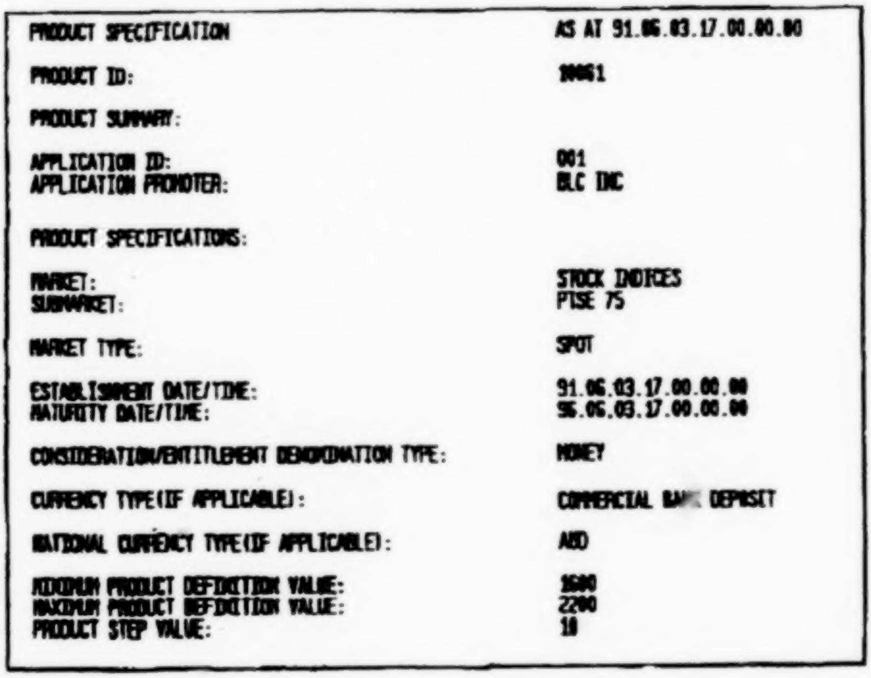


FIG. 73



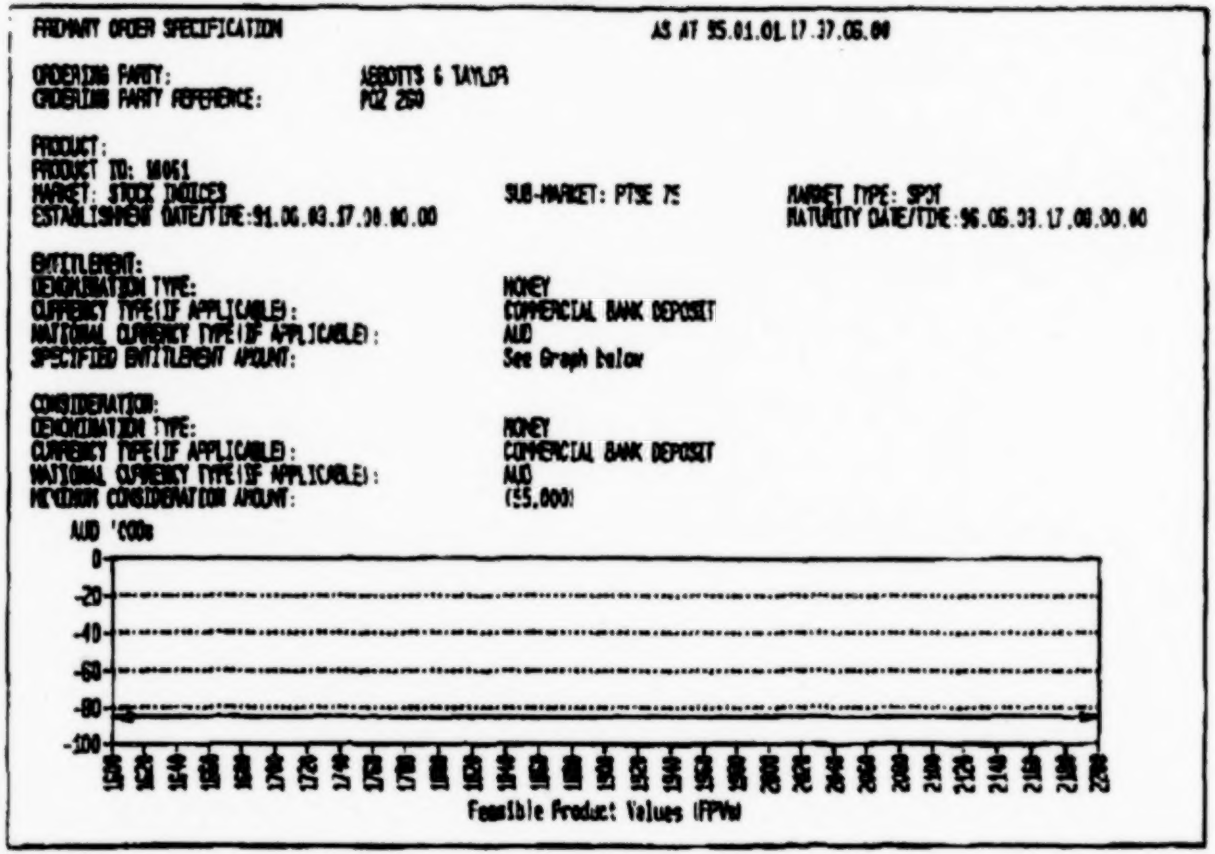
APPLICATION SPECIFICATION	AS AT 91.06.03.17.00.00.00
APPLICATION ID:	001
APPLICATION PROMOTER:	BLC INC
PRIMARY APPLICATION USE:	ECONOMIC RISK MANAGEMENT
FEASIBLE COUNTERPARTY NUMBERS:	MULTIPLE COUNTERPARTIES
PUBLIC/PRIVATE USE?:	PUBLIC USE
ACCEPTABLE COMMS MEDIUMS:	COMPUTER - COMPUTER LINK
RETAIL/WHOLESALE USE:	WHOLESALE USE
PRICING AND MATCHING PROCESS:	MINIMIZE PRE-TAX CONSIDERATION PAYMENT UNDER AN EV/CE REGIME
CONTRACT REVALUATION FREQUENCY:	DAILY
ORDERING PARTIES ALLOWED NEGATIVE CONTRACT PAYOFFS?	YES
APPLICATION ACCESS LIMITATIONS:	NONE

FIG. 74



PRODUCT SPECIFICATION	AS AT 91.06.03.17.00.00.00
PRODUCT ID:	10061
PRODUCT SUMMARY:	
APPLICATION ID:	001
APPLICATION PROMOTER:	BLC INC
PRODUCT SPECIFICATIONS:	
MARKET:	STOCK INDICES
SUBMARKET:	PTSE 75
MARKET TYPE:	SPOT
ESTABLISHMENT DATE/TIME:	91.06.03.17.00.00.00
MATURITY DATE/TIME:	96.06.03.17.00.00.00
CONSIDERATION/ENTITLEMENT DENOMINATION TYPE:	MONEY
CURRENCY TYPE(IF APPLICABLE):	COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):	AUD
MINIMUM PRODUCT DEFINITION VALUE:	1600
MAXIMUM PRODUCT DEFINITION VALUE:	2200
PRODUCT STEP VALUE:	10

FIG. 75



PRIMARY ORDER SPECIFICATION AS AT 95.01.01.17.37.06.00

ORDERING PARTY: ABBOTTS & TAYLOR
ORDERING PARTY REFERENCE: POZ 260

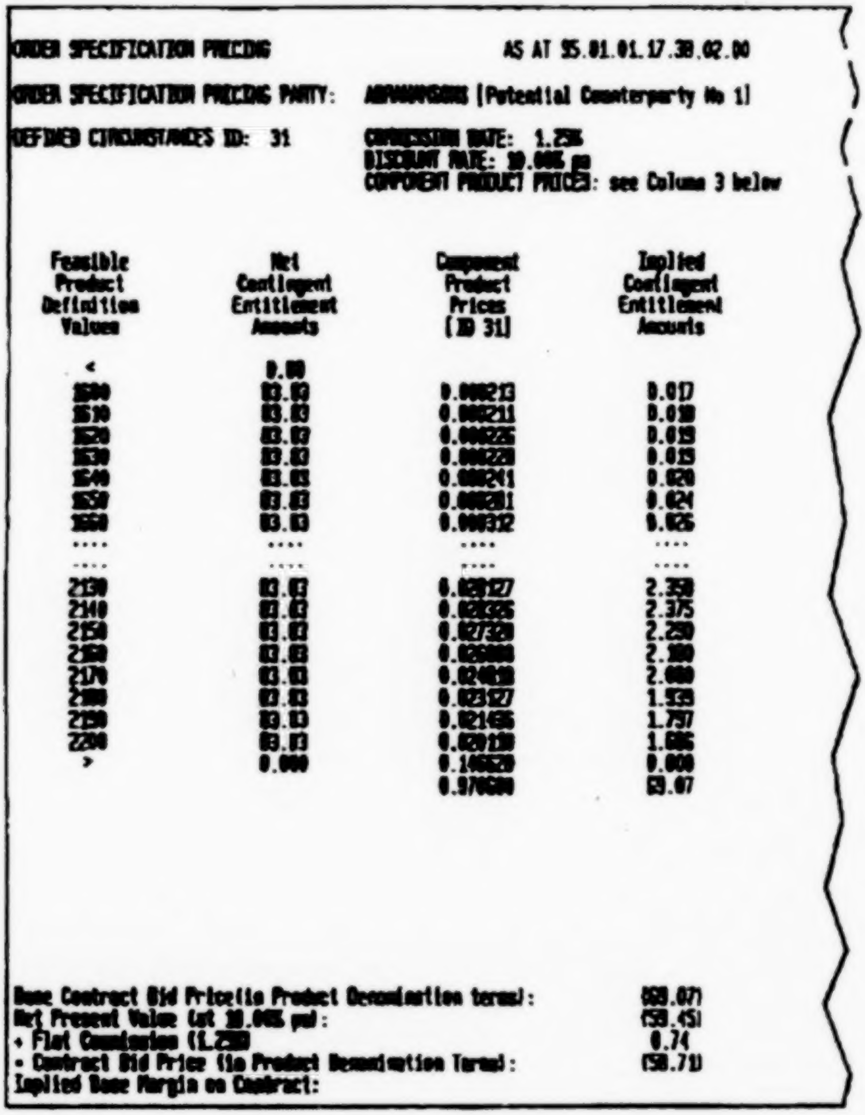
PRODUCT:
PRODUCT ID: 10051
MARKET: STOCK INDICES SUB-MARKET: FTSE 75 MARKET TYPE: SPOT
ESTABLISHMENT DATE/TIME: 91.06.03.17.00.00.00 MATURITY DATE/TIME: 96.06.03.17.00.00.00

ENTITLEMENT:
DENOMINATION TYPE: MONEY
CURRENCY TYPE(IF APPLICABLE): COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE): AUD
SPECIFIED ENTITLEMENT AMOUNT: See Graph below

CONSIDERATION:
DENOMINATION TYPE: MONEY
CURRENCY TYPE(IF APPLICABLE): COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE): AUD
MAXIMUM CONSIDERATION AMOUNT: (55,000)

AUD '000s
0
-20
-40
-60
-80
-100
1600
1620
1640
1660
1680
1700
1720
1740
1760
1780
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
2020
2040
2060
2080
2100
2120
2140
2160
2180
2200
Feasible Product Values (FPVs)

FIG. 76A



```
ORDER SPECIFICATION PRICING                               AS AT 95.01.01.17.38.02.00

ORDER SPECIFICATION PRICING PARTY:     ABRAHAMSONS [Potential Counterparty No 1]

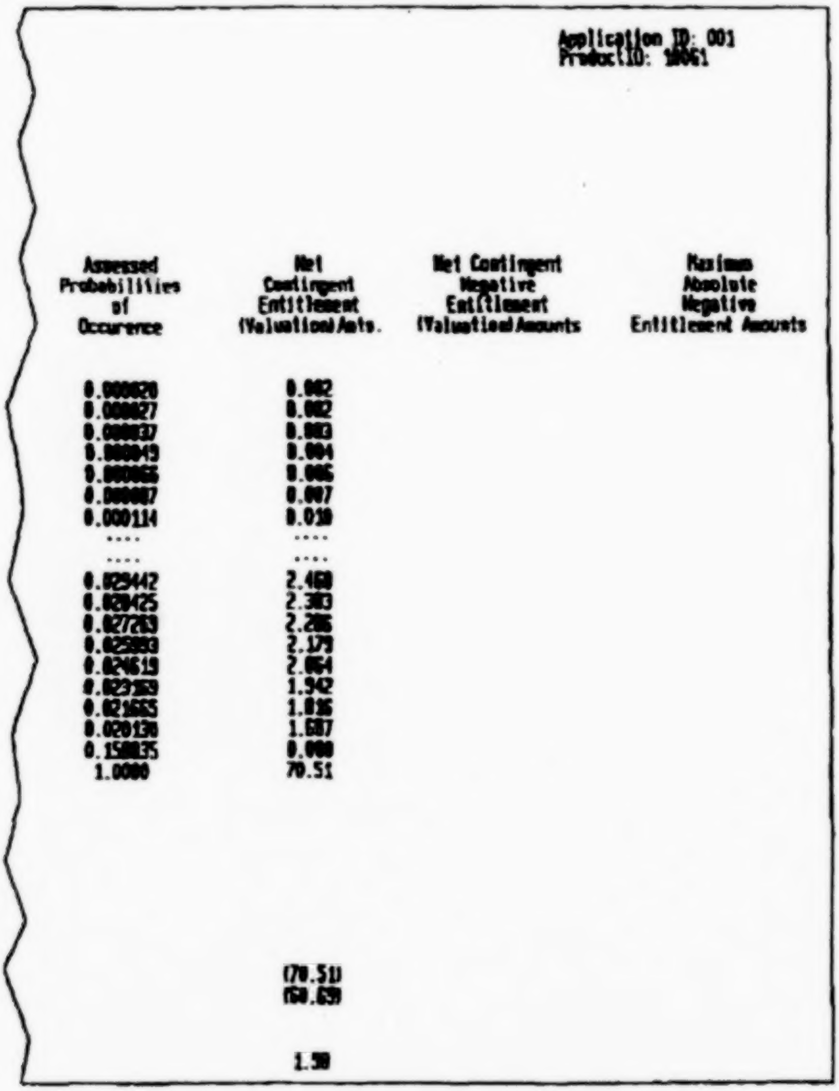
DEFINED CIRCUMSTANCES ID:  31          COMMISSION RATE:  1.25%
                                       DISCOUNT RATE: 10.00% pa
                                       COMPONENT PRODUCT PRICES: see Column 3 below


   Feasible            Net              Component          Implied
   Product          Contingent           Product          Contingent
  Definition        Entitlement          Prices           Entitlement
    Values            Amounts            [ID 31]            Amounts

      <                0.00
     1500             83.83             0.000213            0.017
     1510             83.83             0.000211            0.018
     1520             83.83             0.000226            0.019
     1530             83.83             0.000228            0.019
     1540             83.83             0.000241            0.020
     1550             83.83             0.000281            0.024
     1560             83.83             0.000312            0.026
     ....             ....               ....               ....
     ....             ....               ....               ....
     2130             83.83             0.028127            2.358
     2140             83.83             0.028335            2.375
     2150             83.83             0.027328            2.290
     2160             83.83             0.026000            2.180
     2170             83.83             0.024858            2.088
     2180             83.83             0.023527            1.935
     2190             83.83             0.021486            1.797
     2200             83.83             0.020130            1.686
      >                0.000            0.146528            0.000
                                        0.970600           59.07


Base Contract Bid Price(in Product Denomination terms):          (59.07)
Net Present Value (at 10.00% pa):                                (58.45)
+ Flat Commission (1.25%)                                          0.74
= Contract Bid Price (in Product Denomination Terms):            (58.71)
Implied Base Margin on Contract:
```

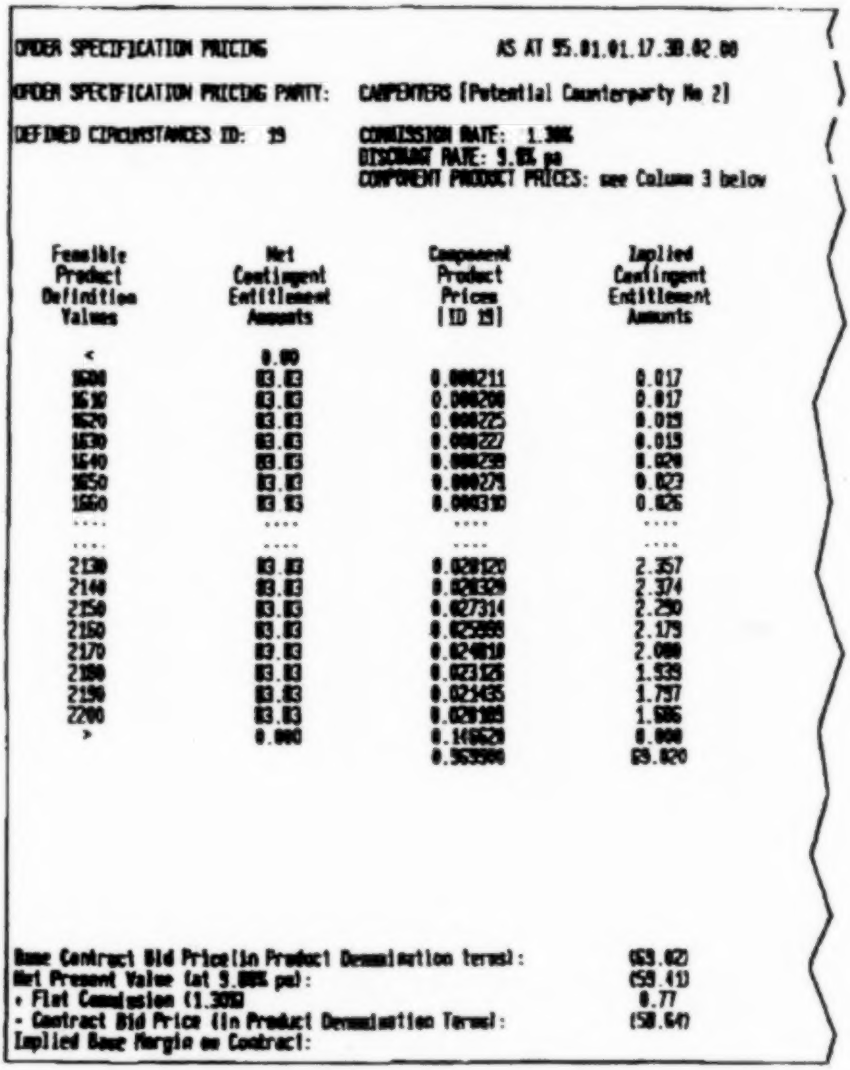
FIG. 76B



Application ID: 001
ProductID: 10061

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
0.000020	0.002		
0.000027	0.002		
0.000037	0.003		
0.000049	0.004		
0.000066	0.006		
0.000087	0.007		
0.000114	0.010		
....	....		
....	....		
0.029442	2.460		
0.028425	2.383		
0.027283	2.286		
0.025983	2.179		
0.024619	2.064		
0.023169	1.942		
0.021665	1.816		
0.020130	1.687		
0.158035	0.000		
1.0000	70.51		
	(70.51)		
	(68.93)		
	1.58		

FIG. 77A



ORDER SPECIFICATION PRICING AS AT 55.01.01.17.30.02.00

ORDER SPECIFICATION PRICING PARTY: CARPENTERS [Potential Counterparty No 2]

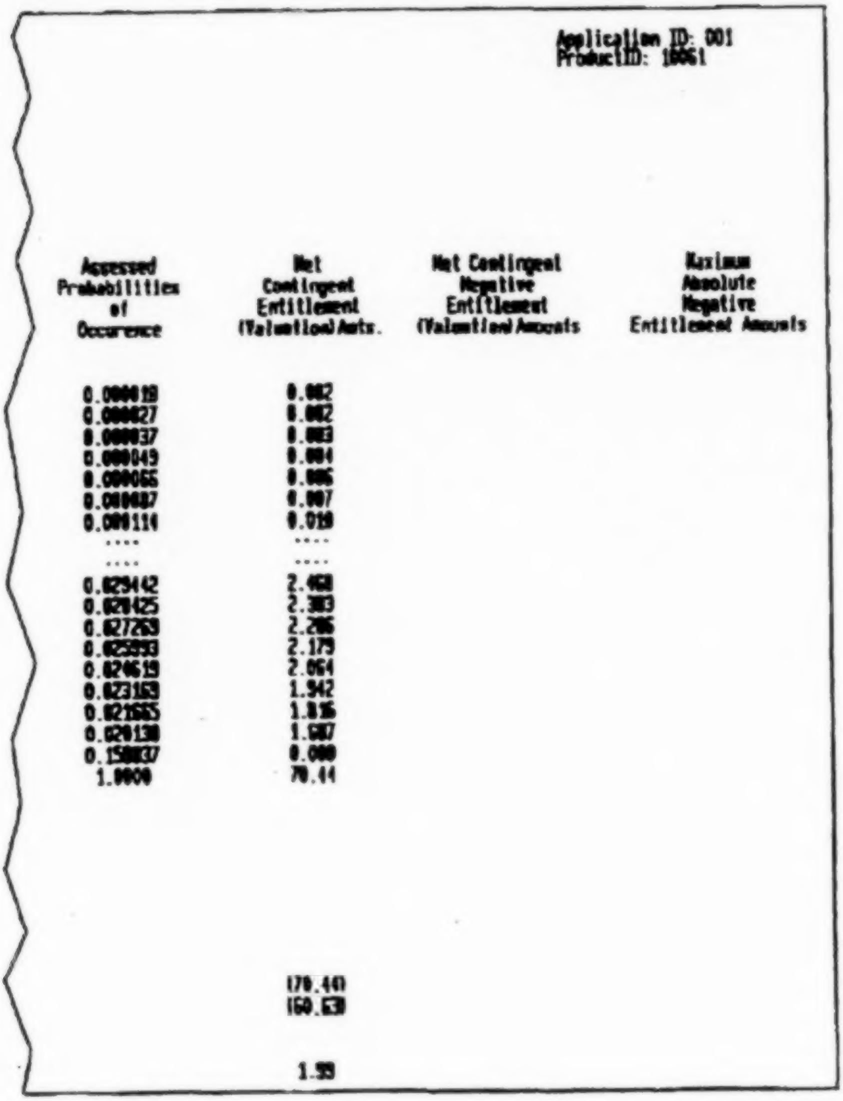
DEFINED CIRCUMSTANCES ID: 19

COMMISSION RATE: 1.30%
DISCOUNT RATE: 9.0% pa
COMPONENT PRODUCT PRICES: see Column 3 below

Feasible Product Definition Values	Net Contingent Entitlement Amounts	Component Product Prices [ID 19]	Implied Contingent Entitlement Amounts
<	0.00		
1600	83.83	0.000211	0.017
1610	83.83	0.000208	0.017
1620	83.83	0.000225	0.019
1630	83.83	0.000227	0.019
1640	83.83	0.000239	0.020
1650	83.83	0.000275	0.023
1660	83.83	0.000310	0.026
....	....	....	....
....	....	....	....
2130	83.83	0.028120	2.357
2140	83.83	0.028329	2.374
2150	83.83	0.027314	2.290
2160	83.83	0.025955	2.175
2170	83.83	0.024810	2.080
2180	83.83	0.023125	1.939
2190	83.83	0.021435	1.797
2200	83.83	0.020109	1.686
>	0.000	0.146620	0.000
		0.363580	69.020

Base Contract Bid Price (in Product Denomination terms): (69.02)
Net Present Value (at 9.00% pa): (59.41)
+ Flat Commission (1.30%) 0.77
= Contract Bid Price (in Product Denomination Terms): (58.64)
Implied Base Margin on Contract:

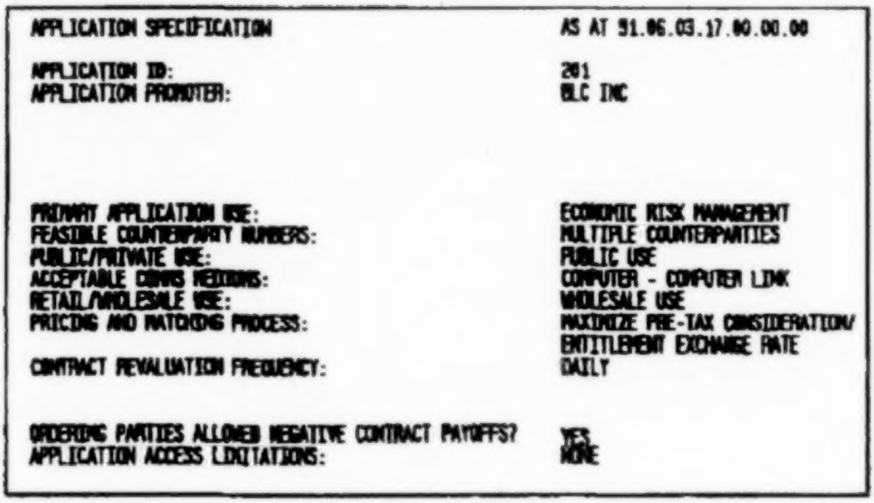
FIG. 77B



Application ID: 001
ProductID: 10061

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
0.000019	0.002		
0.000027	0.002		
0.000037	0.003		
0.000049	0.004		
0.000065	0.006		
0.000087	0.007		
0.000114	0.010		
....	....		
....	....		
0.029442	2.468		
0.028425	2.383		
0.027263	2.286		
0.025993	2.179		
0.024619	2.064		
0.023163	1.942		
0.021665	1.816		
0.020130	1.687		
0.150037	0.000		
1.0000	70.44		
	(70.44)		
	(60.53)		
	1.59		

FIG. 78



```
APPLICATION SPECIFICATION                          AS AT 91.06.03.17.00.00.00

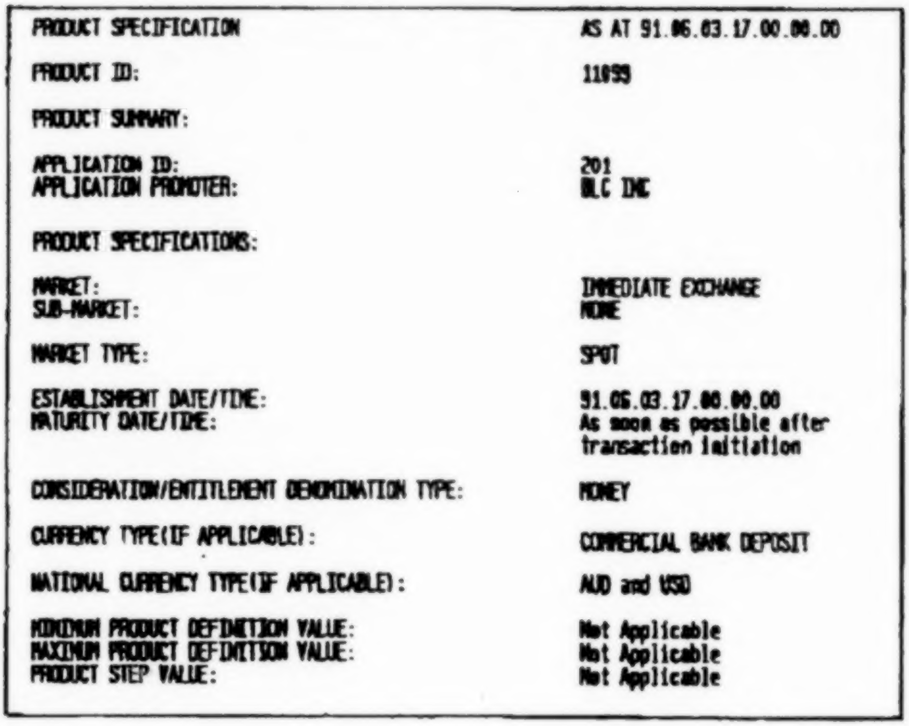
APPLICATION ID:                                    201
APPLICATION PROMOTER:                              BLC INC



PRIMARY APPLICATION USE:                           ECONOMIC RISK MANAGEMENT
FEASIBLE COUNTERPARTY NUMBERS:                     MULTIPLE COUNTERPARTIES
PUBLIC/PRIVATE USE:                                PUBLIC USE
ACCEPTABLE COMMS MEDIUMS:                          COMPUTER - COMPUTER LINK
RETAIL/WHOLESALE USE:                              WHOLESALE USE
PRICING AND MATCHING PROCESS:                      MAXIMIZE PRE-TAX CONSIDERATION/
                                                   ENTITLEMENT EXCHANGE RATE
CONTRACT REVALUATION FREQUENCY:                    DAILY


ORDERING PARTIES ALLOWED NEGATIVE CONTRACT PAYOFFS? YES
APPLICATION ACCESS LIMITATIONS:                    NONE
```

FIG. 79



```
PRODUCT SPECIFICATION                                   AS AT 91.06.03.17.00.00.00

PRODUCT ID:                                             11099

PRODUCT SUMMARY:

APPLICATION ID:                                         201
APPLICATION PROMOTER:                                   BLC INC

PRODUCT SPECIFICATIONS:

MARKET:                                                 IMMEDIATE EXCHANGE
SUB-MARKET:                                             NONE

MARKET TYPE:                                            SPOT

ESTABLISHMENT DATE/TIME:                                91.06.03.17.00.00.00
MATURITY DATE/TIME:                                     As soon as possible after
                                                        transaction initiation

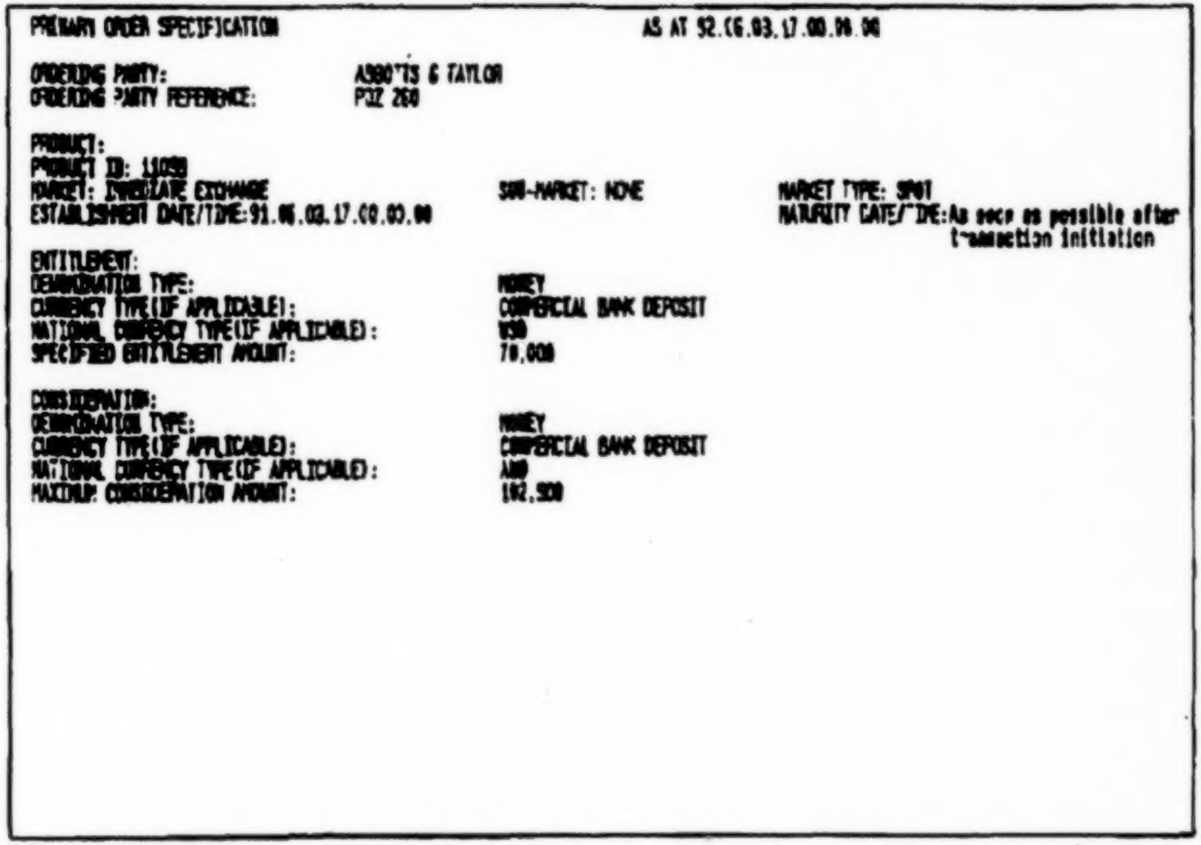
CONSIDERATION/ENTITLEMENT DENOMINATION TYPE:            MONEY

CURRENCY TYPE(IF APPLICABLE):                           COMMERCIAL BANK DEPOSIT

NATIONAL CURRENCY TYPE(IF APPLICABLE):                  AUD and USD

MINIMUM PRODUCT DEFINITION VALUE:                       Not Applicable
MAXIMUM PRODUCT DEFINITSON VALUE:                       Not Applicable
PRODUCT STEP VALUE:                                     Not Applicable
```

FIG. 80



```
PRIMARY ORDER SPECIFICATION                                    AS AT 92.06.03.17.00.00.00

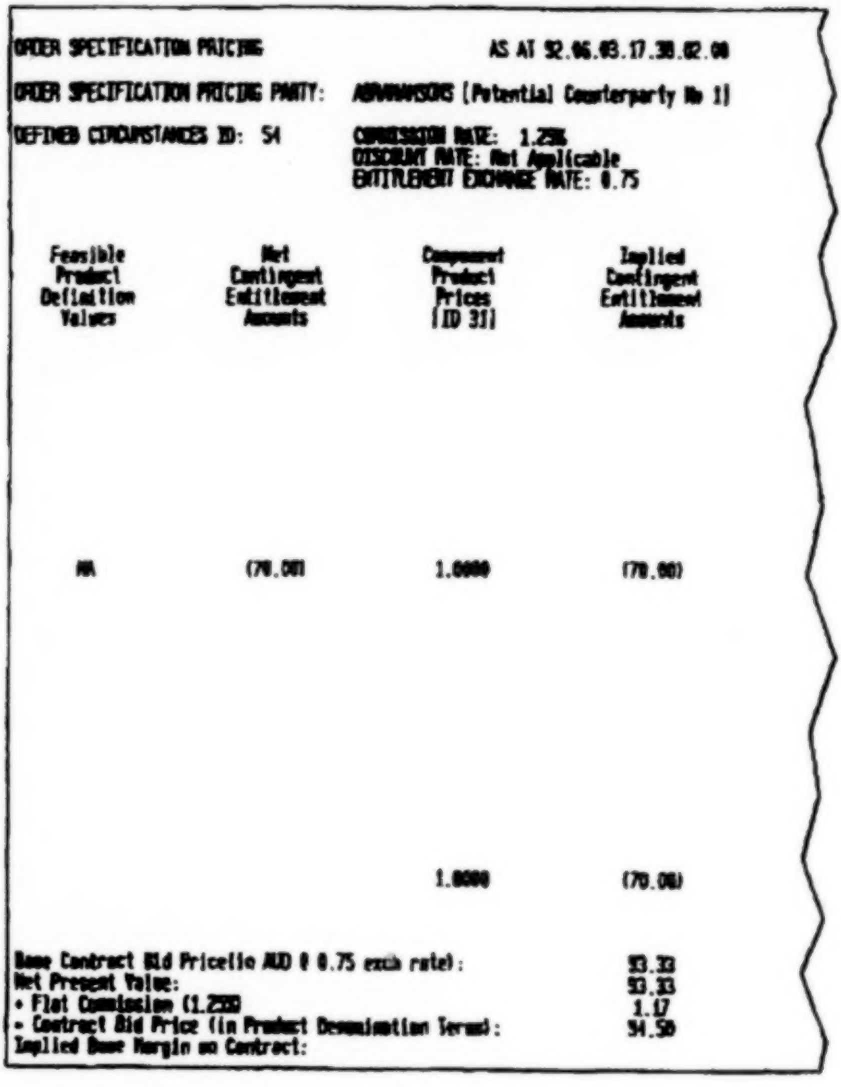
ORDERING PARTY:                   ABBOTTS & TAYLOR
ORDERING PARTY REFERENCE:         PIZ 260

PRODUCT:
PRODUCT ID: 11050
MARKET: IMMEDIATE EXCHANGE                       SUB-MARKET: NONE         MARKET TYPE: SPOT
ESTABLISHMENT DATE/TIME:91.06.03.17.00.00.00                              MATURITY DATE/TIME:As soon as possible after
                                                                                             transaction initiation

ENTITLEMENT:
DENOMINATION TYPE:                               MONEY
CURRENCY TYPE(IF APPLICABLE):                    COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):           USD
SPECIFIED ENTITLEMENT AMOUNT:                    70,000

CONSIDERATION:
DENOMINATION TYPE:                               MONEY
CURRENCY TYPE(IF APPLICABLE):                    COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):           AUD
MAXIMUM CONSIDERATION AMOUNT:                    102,500
```

FIG. 81A



```
ORDER SPECIFICATION PRICING                              AS AT 92.06.03.17.30.02.00

ORDER SPECIFICATION PRICING PARTY:   ABRAHAMSONS (Potential Counterparty No 1)

DEFINED CIRCUMSTANCES ID:  54        COMMISSION RATE:  1.25%
                                     DISCOUNT RATE: Not Applicable
                                     ENTITLEMENT EXCHANGE RATE: 0.75


      Feasible              Net               Component            Implied
      Product            Contingent            Product           Contingent
     Definition         Entitlement            Prices            Entitlement
       Values             Amounts              [ID 31]             Amounts



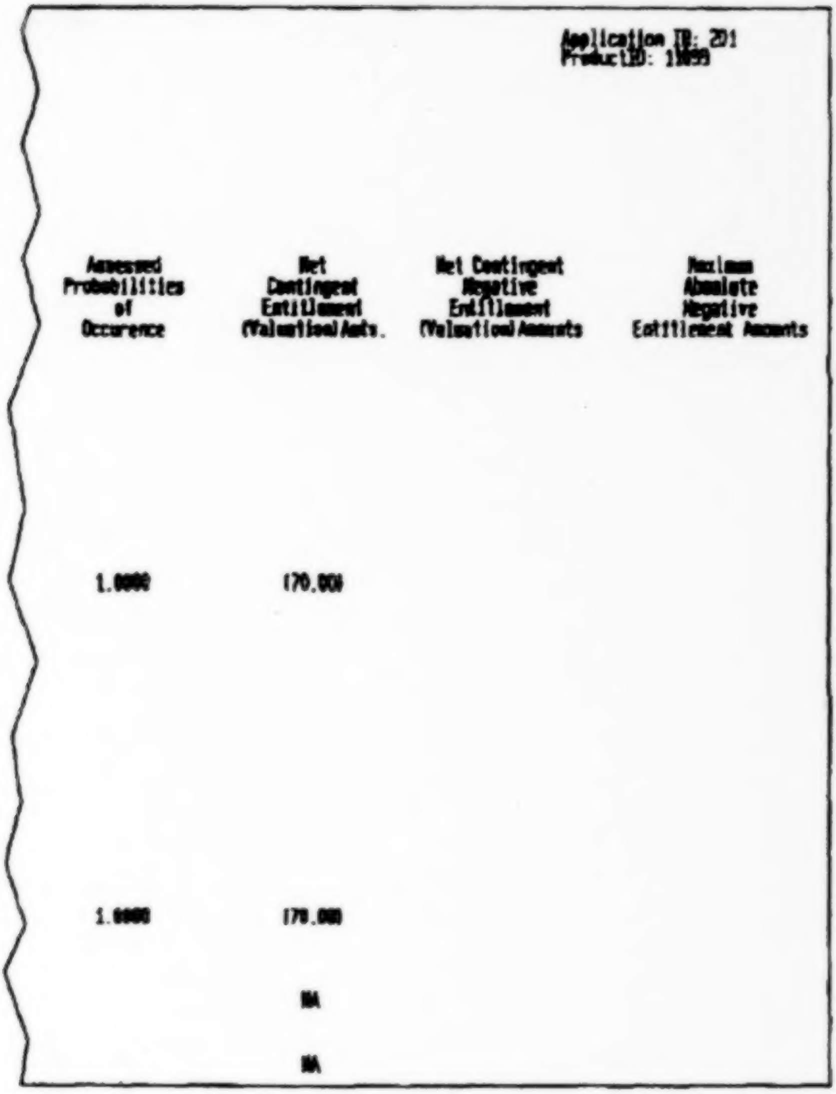

         NA               (70.00)              1.0000              (70.00)




                                               1.0000              (70.00)

Base Contract Bid Price(in AUD @ 0.75 exch rate):                  93.33
Net Present Value:                                                 93.33
+ Flat Commission (1.25%)                                           1.17
= Contract Bid Price (in Product Denomination Terms):              94.50
Implied Base Margin on Contract:
```

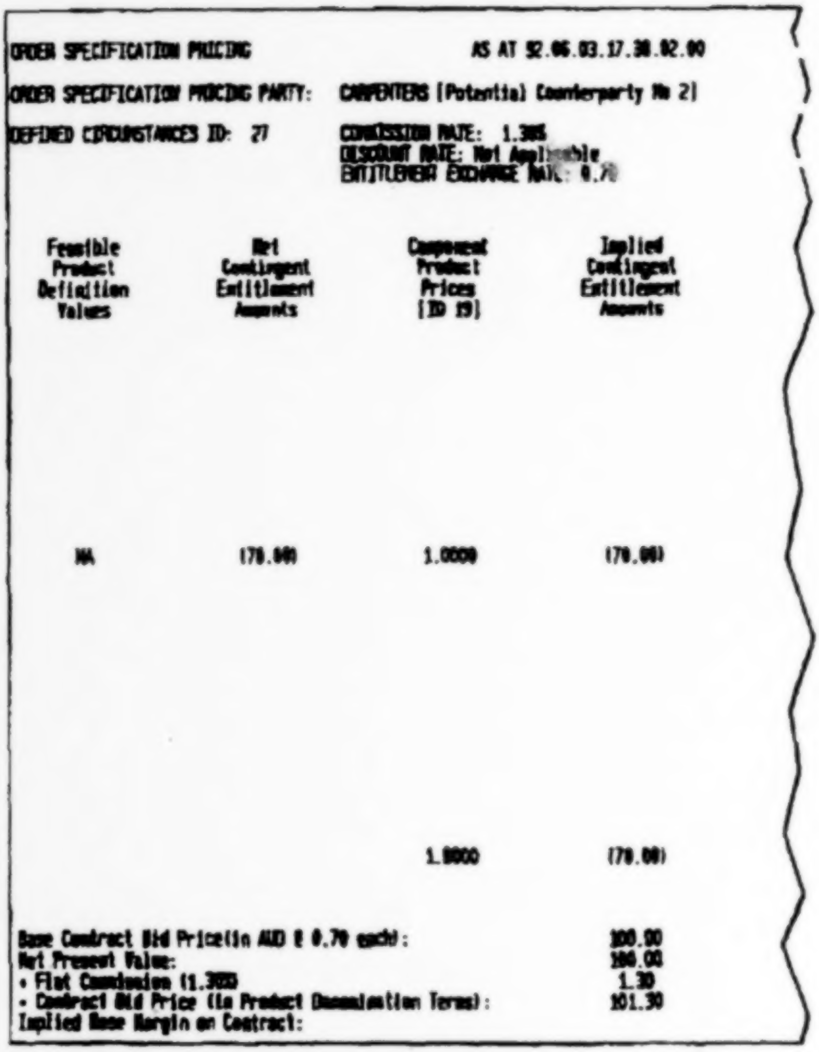
FIG. 81B



Application ID: 201
ProductID: 10055

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
1.0000	(70.00)		
1.0000	(70.00)		
	NA		
	NA		

FIG. 82A



ORDER SPECIFICATION PRICING AS AT 92.06.03.17.30.02.00

ORDER SPECIFICATION PRICING PARTY: CARPENTERS (Potential Counterparty No 2)

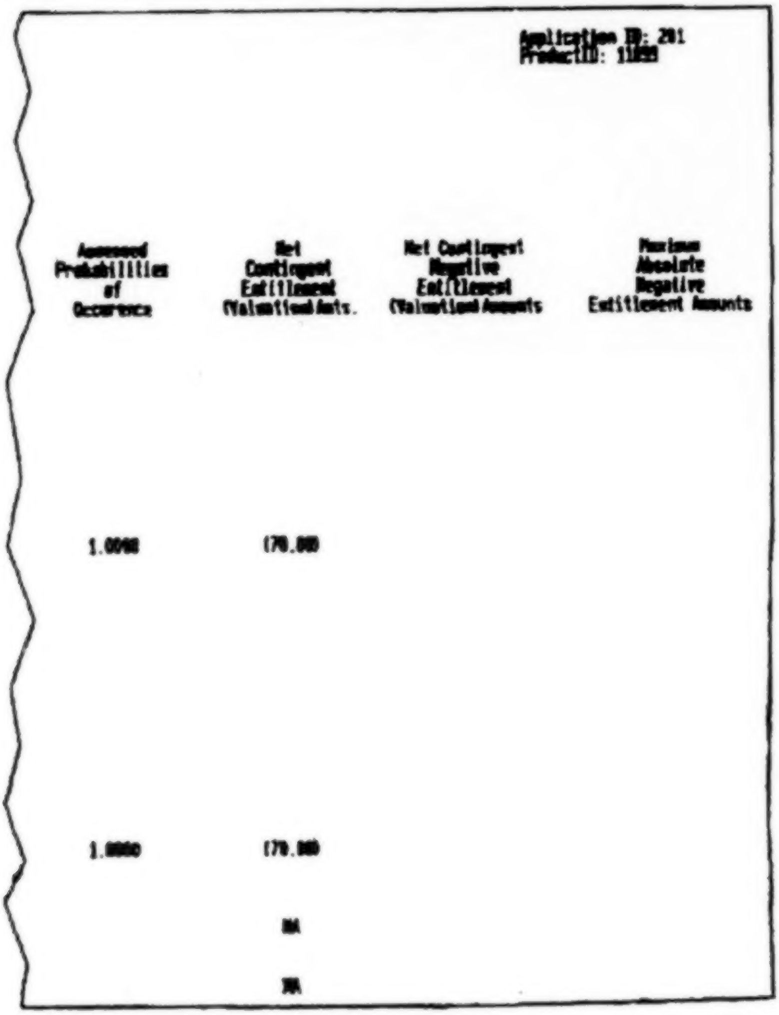
DEFINED CIRCUMSTANCES ID: 27

COMMISSION RATE: 1.30%
DISCOUNT RATE: Not Applicable
ENTITLEMENT EXCHANGE RATE: 0.70

Feasible Product Definition Values	Net Contingent Entitlement Amounts	Component Product Prices (ID 19)	Implied Contingent Entitlement Amounts
NA	(70.00)	1.0000	(70.00)
		1.0000	(70.00)

Base Contract Bid Price(in AUD @ 0.70 each):	100.00
Net Present Value:	100.00
+ Flat Commission (1.30%)	1.30
= Contract Bid Price (in Product Denomination Terms):	101.30
Implied Base Margin on Contract:	

FIG. 82B



Application ID: 201
ProductID: 11000

Assessed Probabilities of Occurrence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
1.0000	(70.00)		
1.0000	(70.00)		
	NA		
	NA		

METHODS OF EXCHANGING AN OBLIGATION

This application is a continuation of U.S. application Ser. No. 08/870,691, filed Jun. 6, 1997, now U.S. Pat. No. 6,134,536, which is a continuation-in-part of U.S. application Ser. No. 08/070,136, filed May 28, 1993, now U.S. Pat. No. 5,970,479, and said U.S. application Ser. No. 08/870,691 is also a continuation-in-part of PCT/AU95/00827, filed Dec. 7, 1995. Both U.S. application Ser. No. 08/070,136 and PCT/AU95/00827, which are commonly owned, are incorporated by reference in their entireties herein.

TECHNICAL FIELD

This invention relates to methods and apparatus, including electrical computers and data processing systems applied to financial matters and risk management. In particular, the invention is concerned with the management of risk relating to specified, yet unknown, future events.

BACKGROUND ART

Individuals and enterprises are continually exposed to risk because of future events beyond their control. The outcome of those events can either positively or negatively impact on their wellbeing.

Individuals and enterprises should generally prefer not to face exposure to the possibility of adverse consequences, regardless of their perception of the likelihood of such events occurring. It is in their interest to consider foregoing 'resources' they currently possess if doing so would reduce the possibility of being so greatly exposed to future outcomes.

Risk can take many forms in view of the large range and type of future events which might result in adverse consequences. Risk can be categorised, in one instance, as ‘economic’ in nature. Phenomena that constitute economic risk include: commodity prices, currency exchange rates, interest rates, property prices, share prices, inflation rates, company performance, and market event based indices.

Another characterisation of risk concerns ‘technical’ phenomena. This can include things like the breakdown of an electricity generation plant, aircraft engine failure, and the damage to, or failure of, orbiting telecommunications satellites. The outcomes for each of these phenomena will be adverse for the users and/or supplier.

Other forms of risk defy ready characterisation, such as weather-based (viz., rain damage or lightning strike), or other natural occurrences (viz., earthquakes or iceberg collision with sea-going vessels).

There are also less tangible risks associated with, for example, the emission of atmospheric pollutants or the disposal of intractable toxic wastes, in the sense that the future consequences are unknown, save that there is a notion, based on current information, that they could be adverse.

The capability to manage risk is more important today than it was in the past, and is likely to become ever-more important into the future, because there is an ever increasing exposure to a wider generic range of future phenomena beyond the control of individuals or enterprises. There is also a wider feasible range of possible future events, and greater uncertainty about the likelihood of occurrence, associated with any single future phenomenon viz., an increasing volatility.

It is also thought that individuals are now more risk-averse in recessionary times, when there are fewer available discretionary resources to trade-off to protect themselves from such adverse future events.

In the prior art, individuals and enterprises faced with 'technical' risk have hedged against future outcomes by mechanisms such as the adoption of quality assurance practices, warranties, increased research and development activity (and associated intellectual property rights such as patents, utility models and registered designs), the purchase of modernised plant and equipment, and improved inventory, occupational health and safety and employer/ employee relations practices.

Consider a manufacturer of, say, integrated circuits (ICs), which has many clients wishing to purchase its ICs. The demand may result in a delay in delivery due to limited manufacturing capacity, thereby requiring advance production scheduling for orders already in-hand. Typically, the manufacturer will give a warranty to a purchaser as to measurable performance criteria for its ICs; if a batch does not perform to the specified criteria, the manufacturer is required by contract to replace that batch. That is, a purchaser may have no interest in obtaining monetary compensation for the poor quality ICs, as the purchaser needs the components for their own products. In that case, the 'consideration' the warranty makes is the priority scheduling of a substitute batch of that type of IC, possibly displacing other scheduled production runs, or deferring delivery to another purchaser.

Such contractual arrangements are piece-meal in nature, and can only be struck between the manufacturer and each individual purchaser. They also leave the manufacturer exposed to claims from other customers whose orders are delayed by the rescheduling. The manufacturer has no convenient mechanism available to it to hedge against such claims, perhaps by way of reserving production rights with another manufacturer, in lieu of unavailability of their own manufacturing facility.

In the face of such 'economic' risk, it is known for individuals and enterprises to hedge against adverse outcomes by indirect means such as self-insurance, and directly by means such as futures contracts, forward contracts, and swaps.

There are disadvantages or limitations associated with such available economic risk management mechanisms. Particularly, they provide, at best, only indirect approaches to dealing with the risk management needs. The available mechanisms are relatively expensive, and provide limited phenomenon coverage, and therefore cannot meet the requirements of the party seeking to hedge against such wide-ranging future risk. The infrastructure and pay-out costs associated with switching between, say, a commodities market and a stock market are often prohibitive for entities small and large alike. As a consequence, entities find themselves saddled with obligations they have little control over and cannot escape.

In respect of the "less tangible" forms of risk, an example in the prior art of a form of management of that risk is that of 'pollution rights' sold by the U.S. Environmental Protection Agency (EPA) in March 1993 for the atmospheric emission of sulphur dioxide. This was done by an auction of "allowances" permitting the release into the atmosphere. By the year 1995, any company or organisation emitting sulphur dioxide in the U.S. without enough allowances to cover their total emissions will face prosecution. This means polluters must either buy further allowances, or else modify or replace their plant and equipment to reduce these emissions. The EPA will regulate the total number of allowances able to be obtained. The existing allowances have already become a valuable tradeable 'property' as between sulphur dioxide emitters, that is, even before the time when no further allowances will be able to be purchased.

Management techniques for the "less tangible" forms of risk are in their infancy. The existing forms indicate an emerging demand for systems and methods to enable effective management.

Specific examples in the prior art of patents relating to methods and apparatus which deal with various forms of risk management include British Patent No. 2 180 380, in the name of Merrill Lynch Pierce Fenner and Smith Incorporated, directed to an Automated Securities Trading Apparatus (corresponding to U.S. Pat. No. 4,674,004, and further related to U.S. Pat. Nos. 4,346,442 and 4,376,978). Other examples include U.S. Pat. No. 4,739,478 assigned to Lazard Freres and Co., directed to Methods and Apparatus for Restructuring Debt Obligations, U.S. Pat. No. 4,751,640 assigned to Citibank, N. A., directed to An Automated Investment System, and U.S. Pat. Nos. 4,752,877, 4,722,055, and 4,839,804 assigned to College Savings Bank directed to Methods and Apparatus for Funding Future Liability of Uncertain Cost.

The present invention comes about in view of the shortcomings of existing risk management mechanisms, and the perceived increasing importance of the management of risk relating to specified, yet unknown, future events.

In this sense, the invention is directed to something having economic value to individuals, enterprises and societies as a whole. Methods and apparatus that provide for the management of risk offer material advantages by, for example, minimising adverse future outcomes, providing both a form of compensation in the event of adverse future outcomes, and forms of risk management not otherwise supported or available in the prior art, and thus have value in the field of economic endeavour.

DISCLOSURE OF THE INVENTION

The invention encompasses methods and apparatus enabling the management of risk relating to specified, yet unknown, future events by enabling entities (parties) to reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent on the occurrence of the specified future events. The entities submit such orders to a 'system' which seeks to price and match the most appropriate counter-party, whereupon matched contracts are appropriately processed through to their maturity.

Therefore, the invention enables parties to manage perceived risk in respect of known, yet non-predictable, possible future events. These future events may relate to measurable phenomena whose outcome is verifiable, and cannot be materially influenced by any other entity having a stake in that outcome.

The ability to price and match risk aversion contracts essentially comes about because of the nature of risk itself. Any number of people will each have differing views as to the likelihood of an outcome of some future event. This means that when each person is required to independently assess a range of outcomes for a specified future date, there almost always will be a variance in those assessments. Thus it is possible to match these expectations as between parties to form a contract. The potential counter-parties to an offered contract have the motivation of taking up an opportunity to exploit differing views of future outcomes to their advantage, either for some gain or, again, as a form of risk management.

It is important that the assessments as to future outcomes of events are made independently of any other party who could be a counter-party to a contract. The nature of the pricing and matching, therefore, is totally different to conventional negotiation or bidding as between parties.

The present invention enables entities to better manage risk, as they are able to think more explicity about possible future events beyond their control which they perceive will have adverse consequences for them. They will have the capacity to utilise existing resources to reduce exposure to a specific risk, and have access to a generally available mechanism by which they can explicity trade-off existing assets for increased certainty about the future. They are also free to decide upon the degree to which they should make such trade-offs, and to actually effect and subsequently manage such trade-offs in a simple and low cost manner.

Risk management contract formulation comprising the steps of order placement, pricing and matching. An ordering party initiates contract formulation by submitting an order that relates to a specified phenomenon that has a range of possible outcomes relative to a future date of maturity. The ordering party specifies elemental entitlements (pay-outs) due at maturity relative to the phenomenon's actual outcome, and a maximum consideration to be paid to a counterparty on matching of a contract. Independently, potential counterparties have submitted registering data based on their assessed probability of each possible outcome at maturity for the phenomenon in question. From this counterparty registering data, a data processing system then seeks to price each counterparty against the ordering party's specified entitlement. Broadly speaking, this involves multiplying each of the elemental ordering party entitlements with the corresponding counterparty probability and summing the results to derive counter considerations. The counter considerations must fall below the ordering party's maximum consideration for there to be the possibility of a match. Most usually a match will be made between the ordering party and the counterparty having the lowest counter consideration.

The ordering stakeholders and counter-party stakeholders can be considered to be contract buyers and contract sellers respectively. The entitlement for each outcome can be in the form of ' money' payoffs (both positive and negative) at maturity of a matched contract, or can be other types of compensation, possibly in the form of goods, services, promises, credits or warrants. The consideration, whether buyer specified or seller calculated, can again be in the nature of a premium or payments, or can relate to other 'non-money' forms of property or obligations, typically transferable when a contract is matched, although possibly deferable, until, and potentially beyond, the time of maturity.

In the period between the match of a contract and maturity the various buyers, sellers and other contract stakeholders can review any contract to which they are a party and seek to trade that contract to other parties by the pricing and matching procedure, or variations on the pricing and matching procedure.

They would tend to do so if their view of the future outcome of the phenomenon, being the subject of the contract, had changed markedly, or as a means to minimise expected losses if some unforseen adverse trend in the present day outcome of the phenomenon has occurred. As well as trading existing contracts, further contracts can be offered to 'lay off' or avert risk. Stakeholder parties can build up a portfolio of matched contracts and offered contracts, which are continually traded to obtain the best possible position at any time, and that position can be continually reviewed with time.

It is further possible for offered contracts to be based on the difference between phenomena, and so manage perceived risk as between the phenomena. Elemental contract phenomena can therefore be developed to meet the most particular needs of buyers and sellers, thus creating great flexibility.

In most instances the date of maturity will be predetermined by a 'product sponsor' stakeholder, who otherwise cannot be a buyer or seller of contracts they sponsor. Even so, it is conceivable that the date of maturity can be tied to a specified time from the instant a contract is matched. This may be appropriate where the time of maturity is in the near future, in which case offered contracts could otherwise remain unmatched following initial offer even up until the time of maturity.

Other stakeholders have executive roles in administration, guaranteeing the performance of buyers and seller, regulation, supervision and so on. In this way the number and types of buyers and sellers that can be considered in pricing and matching offered contracts can be controlled.

The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement.

In another preferred form, the invention provides that the phenomenon for an offered contract is specified such that the elemental entitlements for the range of outcomes are the same for each outcome. In mathematical terms this corresponds to a shape in an x-y cartesian coordinate system where entitlement value (y) with respect to the outcome values (x) is a flat line. Put another way, the entitlement vs. outcome (y,x) shape has zero gradient (y/ x). This type of entitlement/outcome shape can be thought of as a form of lending (if the entitlement is positive, or borrowing if the entitlement is negative), in that the ordering party wishes to make the consideration available for lending now, having the expectation of receiving a known (non-contingent) entitlement in the future. Contract pricing and matching with a counterparty can proceed as described above.

Embodiments of the invention significantly advance the state-of-the-art of formulating and trading risk management contracts. Essentially, this is achieved by a computing/telecommunications infrastructure that is capable of being accessed worldwide by any enterprise/individual having access to a computer and telephone network. Furthermore, a virtually infinite number and range of risk types can be accommodated. One embodiment presents itself in a form that assists users in making consideration-entitlement (insurance-type) trade-off decisions and provides a blind yet transparent price-discovery and trading process. Through its capability to create special case lending/ borrowing and exchange products, end users are also provided with a low-cost mechanism for pricing and acquiring these products without the involvement of traditional intermediaries.

BRIEF DESCRIPTION OF THE DRAWINGS

A number of embodiments of the invention will now be described with reference to the accompanying drawings, in which:

FIG. 1 shows a block diagram of a generic 'system' embodying the invention;

FIG. 2*a* shows a schematic block diagram of an indicative hardware platform supporting the system of FIG. 1;

FIG. 2*b* is a schematic block diagram of an alternate hardware platform supporting the system of FIG. 1;

FIG. 3 shows a representation of INVENTCO and its main component parts;

FIG. 4 shows a block diagram of a subset of the components of an INVENTCO system's markets-depository (M-INVENTCO);

FIG. 5 shows a block diagram of the process components of a subset of one type of 'market' (termed CONTRACT APP) which can reside within M-INVENTCO;

FIG. 6 shows a timeline applicable to Example I;

FIG. 7 shows a timeline applicable to Example II;

FIGS. 8 to 16 show flow diagrams of the contract pricing and matching methodology;

FIG. 17 shows a timeline applicable to Example III; and

FIGS. 18 to 40 show flow diagrams of the first to ninth process components for a CONTRACT APP; and

FIG. 41 shows a timeline for Example IV;

FIG. 42 shows a timeline for Example V; and

FIGS. 43A to 82B show tables and charts associated with Examples I, II, III, IV, and V.

DETAILED DESCRIPTION OF A BEST MODE FOR CARRYING OUT THE INVENTION

1. Introduction

The description firstly discusses the relation of the various users (stakeholders) of the 'system', followed by a consideration of a hardware data processing platform and peripheral input/output devices by which stakeholders interact with each other and the system.

This is followed by a discussion of the scope of the 'applications' that can be supported by the system in relation to the various stakeholders, and the interrelation of component parts thereof.

Details as to software methodologies for implementation of the applications supported by the system are also described, including a number of worked examples relating to the formulation and trading of risk management contracts.

In the course of the detailed description reference is made to a number of non-conventional expressions and terminologies. For convenience, an explanation of these is listed in the Glossary hereinbelow. 2. 'Systems' Configurations

FIG. 1 shows a block diagram of a generic 'system' embodying the invention. The various stakeholders or parties to the system 10 each have access to a centralised processing unit 20. The processing units 20 can be constituted by one or more data processing apparatus, with each one thereof providing access for any one or more of the various stakeholders to applications software supported by the system 10, as all the processing units would be interconnected. Access to the one or more data processing apparatus is controlled by a generic form of communications co-ordination and security processing unit 25.

FIG. 1 also indicates that there are a number of types of stakeholder, and a number of individual stakeholders within each stakeholder type. The basic types of stakeholder are described as: applications promoters 11, product sponsors 12, product ordering parties (buyers) 13, potential product counter-parties (sellers) 14, counter-party guarantors 15, regulators 16, consideration/entitlement transfer (' accounting') entities 17, and miscellaneous parties 18. The detailed roles of each of these stakeholders will be subsequently described in greater detail at a later time. The number of types of stakeholder represented in FIG. 1 is typically the largest that will be supported by the system 10.

An embodiment of a computer system for the system 10 is shown in FIG. 2. The core of the system hardware is a collection of data processing units. In the embodiment described, the processing unit 20 comprises three inter-linked data processors 93, 97, 104, such as the Sun 670 MP manufactured by Sun Microsystems, Inc. of the USA. Each processing unit 93, 97, 104 runs operational system software, such as Sun Microsystems OS 4.1.2, as well as applications software. The applications software is, in part, written around the flow diagrams subsequently described in FIGS. 8 to 16, and FIGS. 18 to 40, and accesses, or otherwise creates, the data files as summarized in the section headed PROCESS 2 VARIABLES AND DATA FILES hereinbelow. The processor configuration shown in FIG. 1 represents a large system designed to handle the transactions of thousands of stakeholders, the input and output data generated by those stakeholders, and risk management contact pricing, matching and subsequent processing functions.

Each processing unit 93,97,104 is operably connected with it one or more mass data storage units 95, 100,110 to store all data received from stakeholders, and other data relating to all other software operations generating or retrieving stored information. Suitable mass storage units are, for example, such as those commercially available from Sun Microsystems.

A number of communications controllers 80,84,87, forming the communications coordination and security processing unit 25, are coupled with the processing unit 20. These controllers effect communications between the processing units 93,97,104 and the various external hardware devices used by the stakeholders to communicate data or instructions to or from the processing units. The communications controllers are such as the Encore ANNEX II, the IBM AS/400 server or the CISCO Systems AGS+.

A large range of communications hardware products are supported, and collectively are referred to as the stakeholder input/output devices 70. One amongst many of the communication devices 70 are personal computers 51 and associated printers 52, which have communications connection with the communications controller 80 by means of a modem 50. There can also be an external host device 53, such as a mini or mainframe computer, again linked with the communications controller 80 by means of a modem 54. In other forms, communications can be established simply by means of a tone dialing telephone 56, which provides for the input of instructions or data by use of the tone dialing facility itself. In the alternative, a voice connection via an operator 75 can be effected by a conventional telephone 58. Both these external devices are shown connected with the communications controller 84. A further possibility is to have data transfer by means of a facsimile machine 65, in this case shown linked to the communications controller 87.

In all cases, users of the input devices are likely to be required to make use of system access password generation and encryption devices such as the Racal RG 500 Watchword Generator 66, 67,68,69, (for personal use) and the Racal RG 1000, which is incorporated in a mainframe computer 53. The corresponding decoding units for these devices are incorporated in the communications controllers 80,84,87.

The generic processing unit 20 also includes a large number of 'portable' information recordal devices, such as printers, disc drives, and the like, which allow various forms of information to be printed or otherwise written to storage media to be transferable. This is particularly appropriate where confirmatory documentation of matched risk contracts is required to be produced, either for safekeeping as a hard copy record, else to be forwarded to any one or more of the stakeholders that are a party to each individual matched contract.

The generic system 10 shown in FIG. 1 encompasses many varied configurations, relating not only to the number and types of stakeholders, but also the 'architectures' realisable by the system hardware and software in combination. In that sense the arrangement shown in FIG. *2a* is to be considered only as broadly indicative of one type of hardware configuration that may be required to put the invention into effect.

For example, FIG. 2*b* shows an alternative configuration that does not rely upon a centralised (hub) data processing unit, rather the necessary processing is performed locally at each stakeholder site 200_n by means of distributed software.

The 'virtual' level of the system 10 is termed INVENTCO. INVENTCO is a collection of one or more potentially interrelated systems, as shown in FIG. 3. Each INVENTCO system (INVENTCO SYSTEM #1 . . . INVENTCO SYSTEM #N) enables the formulation and trading of a wide range of contractual obligations, including risk management contracts. The hardware configuration shown in FIG. 2, is to be understood both as a realisation for a single INVENTCO system, and equally can represent a number of INVENTCO SYSTEMS, where the processing unit 20 is common to all and supports a number of communications co-ordination and security units 25, others of which are not shown, together with associated external communications devices 70, also not shown.

While INVENTCO allows the formulation and trading of risk management contracts, it is also responsible for processing of such contracts through to, and including, their maturity, and in some respects, subsequent to maturity.

Where there are a number of INVENTCO systems, those systems may be inter-dependent or stand-alone in nature. If inter-dependent, INVENTCO (10) is responsible for transactions between those systems.

INVENTCO and all of its component parts can be legally or geographically domiciled in separate countries or states. The supra-national nature of

INVENTCO enables the stakeholders to avail themselves of the risk management mechanisms independently of legal domicile or other such restrictions that are often a feature of some conventional risk management mechanisms, subject to meeting certain criteria regarding credit worthiness and such. Indeed, the legal domicile, location, ownership and participating stakeholders of INVENTCO, or any of the subsystems, can be continually changing.

FIG. 3 further shows that each INVENTCO SYSTEM comprises an infrastructure component, termed I-INVENTCO, and a markets depository component M-INVENTCO. I-INVENTCO is concerned with coordination of communications and other security considerations, that part termed AXSCO, and also provides a network and general management system, termed VIRPRO. M-INVENTCO is a depository of authorised product-market (applications) software residing within INVENTCO under the authorisation of VIRPRO, and as distributed using I-INVENTCO.

One or more local or wide area telecommunication networks may link VIRPRO and M-INVENTCO to AXSCO, and thus to each other. In this way both VIRPRO and M-INVENTCO effectively reside around AXSCO.

AXSCO therefore comprises multiple, uniquely addressed communications controllers linked together in a number of possible ways. In one embodiment, AXSCO is represented by the communications co-ordination and security processing unit 25 shown in FIG. 2. The component hardware, such as the three controllers 80,84,87 shown in FIG. 2, typically are responsible for three types of operational applications. The first is in respect of time stamping data received from other parts of INVENTCO and data similarly transmitted to entities external of INVENTCO. The second is in respect of protecting the identity and/or location of entities within INVENTCO from one another, and from entities external to INVENTCO. The third is responsible for overall management of the routing of data received and to be transmitted within INVENTCO and to external entities thereto.

Referring now to FIG. 4, within M-INVENTCO reside different collections of system sponsored phenomena or 'markets', one collection of which is termed CONTRACT APPS. Each CONTRACT APP within the CONTRACT APPS 'markets' collection is essentially related to a specific type of risk management phenomenon. The purpose of individual CONTRACT APPS is two-fold. First, to effect the trading/exchange/transfer of risk management contracts (and derivatives of these transactions) between participating product ordering parties and counter-parties on terms acceptable to the parties involved, as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trades/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through to their time of maturity.

Individual CONTRACT APPS are responsible for performing the above-described tasks according to the specific rules they embody, defined by their applicable stakeholders.

The role played by the various stakeholders to CONTRACT APPS, remembering that in many cases it would not be necessary to have the involvement of all the possible types of stakeholder, briefly stated is as follows:

(a) An application promoter is an entity having overall responsibility for the functioning of a CONTRACT APP, having being granted that responsibility by VIRPRO.

(b) A product sponsor is an entity which promotes and administers the rules of trading, and subsequent management of defined "products" selected for inclusion in a CONTRACT APP by its application promoter.

(c) An ordering party (buyer) is an entity seeking to acquire a CONTRACT APP product from a potential counter-party (seller).

(d) A counter-party (seller) is an entity potentially prepared to satisfy the CONTRACT APP product needs of an ordering party (buyer).

(e) A guarantor is an entity guaranteeing a seller's ability to settle or meet obligations as a result of a CONTRACT APP effected match.

(f) Regulators are entities overseeing the on-going performance of all other stakeholders involved in a CONTRACT APP, and especially guarantors.

(g) Consideration/entitlement transfer ('accounting') entities are those parties with which all other CONTRACT APP stakeholders maintain 'accounts' to transfer required considerations/entitlements to or from each other.

(h) Other miscellaneous parties are those having some other defined stake in the functioning of a CONTRACT APP. In any implementation of the system, multiple numbers of each form of stakeholder are accommodated. A detailed consideration of the nature of CONTRACT

APPS and the types of stakeholders to a CONTRACT APP is given in the section headed CONTRACT APPS hereinbelow.

As shown in FIG. 5, any one CONTRACT APP consists of a cluster of nine (and potentially more, or fewer) specific processes, these include:

(a) a process handling file administration and updating tasks supporting all other processes (termed Process 1);

(b) a process handling the receipt and processing of "primary" risk aversion contract transactions (termed Process 2);

(c) a process handling the receipt and processing of "secondary" risk aversion contract transactions (termed Process 3);

(d) a process handling the receipt and processing of "derivative-primary" risk aversion contract transactions (termed Process 4);

(e) a process handling the receipt and processing of "derivative-secondary" risk aversion contract transactions (termed Process 5);

(f) a process handling the "back office" management of all four types of risk aversion contract transactions, and transactions handled by Processes 7 to 9 (termed Process 6);

(g) a process handling non-CONTRACT APP-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7);

(h) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to specialist systems to assist the stakeholder concerned to decide how best to interface with a defined element of INVENTCO (termed Process 8); and

(i) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to a range of INVENTCO-facilitated "value added services" (termed Process 9).

A detailed discussion of the nine CONTRACT APP processes is given in the section headed DESCRIPTION OF CONTRACT APP PROCESSES hereinbelow.

All these processes collectively access multiple data files and multiple records within these files. A description of the variables and data files used by Process 2, a key component process of a CONTRACT APP, is provided in the section headed PROCESS 2 VARIABLES AND DATA FILES hereinbelow.

The foregoing description identifies the essential inter-reaction between the hardware platform and the applications computer software run thereon.

A first example of the life-cycle of a risk management contract will now be described. A further detailed discussion of the nature of risk management contracts is given in the section headed RISK MANAGEMENT CONTRACTS hereinbelow.

3. Life Cycle of Risk Management Contract:

EXAMPLE I

The first example of a risk management contract describes a contract to manage risk associated with faults in microprocessors. In summary, the example shows how the system could enable one party, such as a supplier of military standard equipment seeking to avoid the adverse consequences of faulty microprocessors (specifically, 64-bit microprocessors) used in that equipment to make a contract with another party, such as a manufacturer of these microprocessors, who is seeking to exploit an opportunity based on their view of the future incidence of faults in the microprocessors they produce.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to "exclusive production warrants" (XPWs). That is, warrants providing the holder with priority access to a specified quantity of replacement and additional microprocessors sourced, immediately, from a defined, different, guaranteed high-quality, production line available to the supplier in consideration of payment of a money amount. The XPW entitlement is contingent on the value, at contract maturity date, of a percentage index of the proportion of 64-bit microprocessors shipped by the manufacturer, during a specified prior period, which are subsequently determined to be faulty to a defined degree. The defined degree, in this case, is the microprocessor being fault-free, as determined by successful completion of self-tests.

In this example, the relevant key stakeholders are: an application promoter (Demdata Inc); various product sponsors (the relevant one for the example being Demdata Inc itself); various primary product ordering parties (the relevant one for the example being Denisons); a single potential counterparty (Demdata Inc again); and an application regulator (the Department of Defence).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 6. FIGS. 43A-50B are eight detailed explanatory charts supporting FIG. 6. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 43A and 43B, it can be seen that Demdata Inc. established a Contract APP (Application ID100) on 92.02.10.17.00.00 (that is, in inverse order, 5 pm on Feb. 10, 1992) to deal with defect liability management. Application ID100 supports a range of products (Applicable Product ID's 1200-1250).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 44A and 44B, it can be seen that Demdata was also Product Sponsor of Product 1210 at the same time (92.02.10.17.00.00). This Product relates to the market termed: Factory Output Quality Indices, and to the sub-market termed 64-bit Microprocessor Fault Tolerance Index. The maturity date for Product 1210 is 95.02.10.17.00.00.00. The consideration for a specific contract involving Product 1210 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is in the form of Exclusive Product Warrants (XPWs); these entitle the contract ordering party to priority access over the forward production capacity of a defined, guaranteed-high-quality, 64-bit microprocessor production line. Product 1210 specifies a range of 0% to 100% in 2% increments in respect of the sub-market outcomes.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), it can be found that Demdata is acting as the sole potential counterparty for forthcoming primary product orders dealing with Product 1210. At this point in the timeline (93.07.01.14.00.00.00), 17 months after the specification of Product 1210, Demdata has currently-

specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with FIGS. 45A and 45B, it can be seen that an Ordering party, Denisons, is seeking a contract (from the offering party, Demdata) in Product 1210 at that time (93.07.01.14.25.30.00). FIGS. 45A and 45B show the specific "pay-off" parameters that Denisons has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration (premium) amount of 32,000 (denominated in commercial bank, Australian dollars).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 46A and 46B, it can be seen that Demdata (using the specified pricing parameters set at (93.07.01.14.00.00.00) prices the Denison order 93.07.01.15.26.40.00. Demdata's pricing parameters indicate that their appropriate Defined Circumstances ID for Denisons is 14. As is shown, this ID in turn implies a Commission Rate of 1.10%, a Discount Rate of 9.90%, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence over the range of feasible product values (outcomes).

The Contract Bid Price is calculated automatically by the application software in the following manner: The ordering party-specified desired contingent entitlement amounts, i.e. the "registered data", (covering the feasible product definition value range) are multiplied by the potential counterparty-specified component product prices (which will rarely add to "1" because each counterparty is endeavouring to 'game' potential ordering parties in different ways) to yield the corresponding number of implied contingent entitlement amounts. When added together, these figures sum to (34.110), where the brackets signify a negative value. This figure represents an expected future counterparty-entitlement payout amount (as at the designated contract maturity date of 95.02.10.17.00.00). The present day value of this figure, calculated using the specified discount rate of 9.90% per annum, is 29,220. To this amount is added the potential counterparty's desired flat commission amount of 1.10%, yielding a contract Bid Price (in the consideration/entitlement denomination of the product, commercial bank-denominated Australian dollars) of 29,540. No exchange rates are applicable in this case, because the ordering party, Denisons, is not seeking to deal in a consideration or entitlement denomination different to the denominations formally specified for the product. Demdata's parameters calculate that a consideration bid price of 29,540 will yield them a base margin on the contract of 3,180 (again denominated in commercial bank, Australian dollars).

This margin amount is calculated in the following manner: The ordering party-specified desired contingent entitlement amounts (covering the feasible product definition value range) are multiplied by the potential counterparty-specified assessed probabilities of occurrence to yield a corresponding number of net contingent entitlement valuation amounts. When added together, these sum to (30.770). This amount represents an expected future counterparty-entitlement loss-on the contract (as at the designated contract maturity date of 95.02.10.17.00.00). The present value of this amount, calculated using the specified discount rate of 9.90% per annum, is 26,360. Thus, (ignoring for this example the margin Demdata may gain from using, in some manner, the consideration amount of 29,540 through to the time the contract expires, and various transaction fees) the margin Demdata can expect from entering into this contract with Denisons is their calculated present-value indifference price of 29,540 less their calculated present-value expected loss on the contract of 26,360 (or 3,180).

The amounts in the last two rows of the table of FIGS. 46A and 46B are used for checking that this contract, if entered into by Demdata, will not result in them violating any self imposed portfolio valuation or composition limits. This notion is explained in detail in Example III.

Looking at the sixth step in the timeline (Order Matching), it can be found that Demdata's contract bid price of 29,540 is below Denison's specified maximum consideration price of 32,000, leading to a matching of the order at 93.07.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be seen to take place twelve minutes later at 93.07.01.14.38.50.00, after the system has determined that Denisons is able to (and then does) immediately pay the required consideration funds amount of 29,540 to Demdata.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 47A and 47B, it can be seen that a contract valuation report for Denisons was published not much longer than one hour after confirmation of the contract, that is, at 93.07.01.16.00.00.00. As can be seen, the market estimate of the future product value of the 64BMFT Index at this moment is 38 (with a standard deviation of 4), which implies that this contract has an expected future value of 29,330 XPWs (with a standard deviation of 6,213).

On FIGS. 48A and 48B it can be seen the equivalent report for Demdata Inc. of their expected future entitlement payout is identical to Denisons' expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/ receipts). The above-described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The ninth step in the timeline (Contract Valuation) refers to a contract valuation report published for Denisons sixteen months later, at 94.11.15.10.00.00.00 (see FIGS. 49A and 49B). As can be seen, the market estimate of the future product value of the 64 BMFT Index at this moment is 58 (with a standard deviation of 5), which implies that this contract now has an expected future value of 42,160 XPWs (with a standard deviation of 6,209). This is an increase in expected future value of 12,830 XPWs for Denisons since the former valuation date/time.

The tenth step in the timeline, Contract Maturity, refers to the actual determination of the product value at time of maturity, 95.02.10.17.00.00.00. As can be seen on FIGS. 50A and 50B, this product value of the 64 BMFT Index was specified by Demdata (as Product Sponsor) to be 74, implying a contract value of 100,660 XPWs to Denisons and a corresponding obligation on Demdata. The amount of 74 represents the percentage of 64-bit microprocessors shipped by Demdata, during a specified period some time before the designated contract maturity date, which are subsequently determined (possibly by the application regulator, The Department of Defence) to be faulty.

The eleventh step in the timeline involves the formal assignment of 100,660 XPWs by Demdata to Denisons (ignoring possible fee payments by one or both parties). 4. Life Cycle of Risk Management Contract:

EXAMPLE II

The second example describes a risk management contract associated with the utilisation of telecommunications carrying capacity. In summary, the example shows how the system could enable one party (a telecommunications carrier) seeking to avoid the adverse consequences of under and over-committing their call carrying capacity between specified points (say, between the two cities, New York and Boston) to make a contract with another party (say, another telecommunications carrier with call carrying capacity between the same two cities) similarly prepared to hedge against the consequences of this occurring.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to transmission time units between the hours 1200-1800 daily on the NY-Boston link within a defined future period (termed, Prime TTU's) upon assignment by the ordering party—to the counterparty—of a calculated consideration amount of Prime TTUs on the ordering party's own NY-Boston line within another defined future period (these defined TTUs may or may not be convertible to TTUs on other city links). The TTU entitlement is contingent on the value, at contract maturity date, of the log of the difference between the ordering party's utilisation of the counterparty's network and the counterparty's utilisation of the ordering party's network, during a specified prior period ending on the contract maturity date.

In this example, the relevant key stakeholders are: an application promoter (Newcom Inc); various product sponsors (the relevant one for the example being Newcom Inc itself); various primary product ordering parties (the relevant one for the example being Basstel Co.); two potential counterparties (Tasnet and Aarcom); and an application regulator (ITT).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 7. FIGS. 51A-59B are nine detailed explanatory charts supporting FIG. 7. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 51A and 51B, it can be seen that Newcom Inc. established a Contract APP (Application ID 001) on 93.11.01.17.00.00 (that is, 5 pm on Nov. 1, 1993) to deal with hardware capacity management. Application ID 001 supports a range of products (Applicable Product ID's 2001-2020).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 52A and 52B, it can be seen that Newcom Inc. was also Product Sponsor of Product 2001 at the same time (93.11.01.17.00.00). This Product relates to the market termed Telecommunications Carrying Capacity and to the sub-market termed Prime TTUs. The maturity date for Product 2001 is 96.11.01.17.00.00.00. The consideration for a specific contract involving Product 2001 is in the form of "Ordering Party TTUs". The entitlement is in the form of "Counterparty TTUs";

these entitle the contract ordering party to "transmission time units between the hours 1200-1800 daily on the NY-Boston link (within a defined future period)". The feasible values of PRIME TTUs are normalized in the range of -1.0 to +1.0, respectively signifying the proportionate utilization of respective networks as between the parties to a contract.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two other carriers, Tasnet and Aarcom, acting as potential counterparties for forthcoming primary product orders dealing with Product 2001. At this point in the timeline (94.06.01.14.00.00.00), 7 months after the specification of Product 2001, both Tasnet and Aarcom have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with FIGS. 53A and 53B, it can be seen that an Ordering Party, Basstel Co., is seeking a contract, from an offering party, in Product 2001 at that time (94.06.01.14.25.30.00). FIGS. 53A and 53B show the specific parameters (entitlements) that Basstel Co. has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 58,000 (denominated in its own TTUs).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 54A and 54B, it can be seen that Tasnet (using the specified pricing parameters set at 94.06.01.14.00.00.00) prices the Basstel Co. order at 94.06.01.14.26.40.00. Tasnet's pricing parameters indicate that their appropriate Defined Circumstances ID for Basstel Co. is 8. As is shown, this ID in turn implies a Commission Rate of 1.00%, a Discount Rate of 9.90% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example 1, this results in a Contract Bid Price of 55,180 (denominated in Basstel Co. TTUs), which Tasnet's parameters calculate will yield them a base margin on the contract of 10,760 (again denominated in Basstel Co. TTUs).

Still looking at the fifth step in the timeline, in conjunction with FIGS. 55A and 55B, it can be seen that Aarcom (again using the specified pricing parameters set at 94.06.01.14.00.00.00) also prices the Basstel Co. order at 94.06.01.14.26.40.00. Aarcom's pricing parameters indicate that their appropriate Defined Circumstances ID for Basstel Co. is 9. As is shown, this ID in turn implies a Commission Rate of 0.90%, a Discount Rate of 8.50% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results in a Contract Bid Price of 55,390 (denominated in Basstel Co. TTUs), which Aarcom's parameters calculate will yield them a base margin on the contract of 9,430 (again denominated in Basstel Co. TTUs).

Looking at the sixth step in the timeline (Order Matching) it can be found that Tasnet's price bid of 55,180 is below Aarcom's bid of 55,390 and, in turn, that the 55,180 amount is below Basstel Co.'s specified maximum consideration price of 58,000. This leads to a formal matching of Basstel Co.'s order by Tasnet at 94.06.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be seen to take place nearly ten seconds later at 94.06.01.14.38.50.00, after the system has determined that Basstel Co. is able to (and then does) immediately assign the required consideration amount of 55,180 TTUs to Tasnet.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 56A and 56B, one can see a contract valuation report for Basstel Co. published about two hours after confirmation of the contract, that is, at 94.06.01.16.00.00.00. As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet's network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.150) (with a standard deviation of 0.023), which implies that this contract has an expected future value of 54,236 Tasnet TTUs (with a standard deviation of 9,207). On FIGS. 57A and 57B one can see in the equivalent report for Tasnet that their required expected future entitlement payout is identical to Basstel Co.'s expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Contract Valuation) refers to a contract valuation report published for Basstel Co. five months later, at 94.11.22.10.00.00.00 (see FIGS. 58A and 58B). As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet's network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.400) (with a standard deviation of 0.010), which implies that this contract now has an expected future value of 350,181 Tasnet TTUs (with a standard deviation of 74,200). This is an increase in expected future value of 295,945

TTUs for Basstel Co. since the former valuation date/time.

The tenth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 96.11.01.17.00.00.00. As can be seen on FIGS. 59A and 59B, this product value of TTU's was specified by Newcom Inc (as Product Sponsor) to be (0.400), unchanged from the prior valuation date/time, implying a contract value of 368,340 Tasnet TTUs to Basstel Co. and a corresponding obligation on Tasnet. The amount is higher than the prior valuation figure due to the actual determination figure being naturally without a standard deviation element.

The eleventh step in the timeline involves the formal assignment of the 368,340 TTUs by Tasnet to Basstel Co. (ignoring possible fee payments by one or both parties). 5. Primary Product Order Processing

Before describing the third, and most detailed, example, consideration will be given to the 'core' product (contact) ordering, pricing and matching processes. Note that expressions such as (PORD NEW) represent file names.

The flow charts in FIGS. 8 to 16 depict the processing flow of the matching system for primary product orders submitted by ordering party stakeholders to a CONTRACT APP, where this APP is based upon: an EV-CE counterparty pricing regime (assuming paid consideration amounts do not yield an income stream in their own right); a sequential order matching process; consideration/entitlement value dates which are immediately after a product sponsor-designated date/time; and matching rules which do three things: First, identify, for each ordering party's order, a counterparty offering the lowest price bid for an order, subject to this price being at or below the specified maximum price the ordering party has indicated it is prepared to pay. Second, accommodate portfolio expected loss constraints on an 'equivalent maturity date products', 'same-month maturity products', and 'all-products' basis. And third, apply the above-described matching rules on a pre-tax basis, with partial matching of product orders, and without conditional order matching rules.

As shown in FIG. 8, starting at block 610, and proceeding to block 625, the system determines which set of orders to process, authorises these orders, matches them with counterparties where possible, and then confirms them. As shown in blocks 1010 to 1070 in FIG. 9, the system holds newly submitted orders (PORD NEW), and all previously submitted, but as yet unmatched, orders which are defined as queued orders (PORD QUEUE). Parameters and algorithms can be implemented to give the system the ability to determine whether new or queued orders are to be processed at any time. For example, a simplistic algorithm would be to alternate between PORD NEW and PORD QUEUE one order at a time. Another example would be to load queued orders only when there is a change in the counterparty parameters. Test 1020 checks the decision made in block 1010.

For new orders, the system moves to block 1030. Details of the next recorded new order are loaded from the PORD NEW master file (block 1040). The order data fields include: the ordering party identification (BID); the ordering party's own reference (BREF); the product identification (PID) specified by the ordering party; the entitlement "payoff" function type (PAYFUNC); the parameters for the entitlement "pay off" function (PAYPARAM); a "deal type" identifier (DTID); the anonymous and manual deal identifiers (OANON and OMANUAL); the order retention time limit (RET LIM); the maximum consideration the ordering party is prepared to pay (MAXCONSID); the number of the account from which the consideration is to be "paid" (ACC CONSID); and the number of the account to which any entitlement "pay off" amount is to be paid (ACC ENTITL). With this information set, the system's next step is to authorise the order. This occurs at block 1050. Order Authorisation

Blocks 1100 to 1162 in FIG. 10 provide an expansion of block 1050. Starting at block 1100 the order is assigned a unique identification, which is set in the order data field OID. Before verifying the order, additional information is required by the system. At block 1110, details of the product (order data field PID) are loaded from the master file PPRODUCT (block 1120). The information includes the product maturity date (PMAT); the product consideration/entitlement denomination (PC/ED); the product currency denomination (PCUR) and national currency denomination (PNCUR); and the product limits and parameters (PMIN, PMAX, and PSTEP). The test 1130 checks that the order parameters are consistent with the master file parameters implied by the defined product identification (PID). Orders which fail this test are rejected at block 1140, with details of these orders being stored in the master file PORD REJ (block 1150). In turn, the ordering party is informed of this event (block 1160). Processing then returns to the start of the flow chart (block 1010), ready to load the next order. When an order is authorised, processing continues at block 640.

In the case of a queued order being loaded (block 1060), the order fields are set using the details stored in the queue file PORD QUEUE (block 1070). This data is a combination of new order data (as described in block 1030) and the data loaded/set when the order was originally verified (block 1110). Authorised order processing continues with the order matching process at block 640. Order Matching

Blocks 1200 to 1616 in FIGS. 11 to 15 provide an explanation of block 640. Orders have retention time limits, stored in the order variable RET LIM. Test 1200 checks that the order retention time has not expired. If it has, the order is rejected at block 1210, with the order details copied to the rejected order file (PORD REJ). The ordering party is then informed of the rejection at block 1230, and processing returns to the main loop via connector “A”. If the order is still valid, the order matching process proceeds. The aim now is to find a suitable counterparty (or counterparties) who “prices” the ordering party’s “entitlement function” within the limits set by the ordering party. Starting at block 1240, the matching process described is one which seeks to identify, for each ordering party’s order, a counterparty offering the lowest “price bid” for an order subject to this price being at or below the specified maximum “price” the ordering party has indicated it is prepared to pay.

Blocks 1300 to 1370 in FIG. 12 provide an explanation of block 1240. The first step is to narrow down a group of counterparties prepared to at least deal with the ordering party. This is described as obtaining the available counterparty short list. First the counterparty short list is wiped (block 1300). Next, the order data fields BID (ordering part identification) and PID (product identification) are used to search the PDEAL

LIST master file (block 1320) for all counterparties prepared to consider dealing with the ordering party in the specified product. Any stakeholders who have set a MANUAL or ANON flag are also loaded. For each counterparty selected, SID is set to the corresponding identification. Test 1330 commences a loop which allows every counterparty available to be dealt with in turn. For any currently selected counterparty (with identification set in SID), the data flow proceeds to test 1365. Where the order data field OANON has been set by the ordering party and some stakeholder requires manual confirmation (MANUAL (SID)), the current potential counterparty is not included in the short list. Likewise if the ordering party set OMANUAL and some other stakeholder required anonymity (ANON (SID)). In both cases, data flow returns to test 1330. Otherwise, flow continues at block 1335. At this point, the system determines the applicable "defined circumstances" for the order. It uses the order data fields currently loaded and parameters set in the PSEL DC masterfile (block 1336) to determine this. At block 1340, pricing parameters including consideration/entitlement exchange rates (if applicable), commission rates, and discount rates are selected from the PSEL PRICE master file (block 1350). Using the "defined circumstances" identification (set in DCID) all potential counterparties can have different sets of pricing parameters specified based on any of the order data fields of each order. Test 1360 checks that all the necessary parameters have been found. It is possible that the counterparty, though prepared to deal with the ordering party, does not have a complete set of pricing parameters for the current order specifications. Such a counterparty is not included in the counterparty short list, and processing returns to test 1330. At block 1370, the counterparty is added to the counterparty short list by including the pricing details in the variables: PRICEFUNC(SID), CR(SID), DR (SID), C-C/EDXCHANG(SID), C-CXCHANG(SID), C-NCXCHANG(SID), E-C/EDEXCHANG(SID), E-CXCHANG(SID), E-NCXCHANG(SID), MANUAL (SID), and ANON(SID). Processing then returns to test 1330 where the next selected potential counterparty is dealt with. When all selected potential counterparties have been processed, program flow returns to block 1250. At this point a potential counterparty short list has been obtained.

Blocks 1400 to 1550 in FIGS. 13 and 14 depict block 1250 in more detail, where every potential counterparty has its price offer calculated, based on their individual pricing parameters, for the currently loaded order. At block 1400 a loop commences allowing each potential counterparty in the potential counterparty shortlist to be dealt with in turn. SID is set to the identification of the counterparty currently selected. Test 1410 checks whether any counterparties are left for processing. At block 1420, the potential counterparty's price bid is calculated. Blocks 1490 to 1550 describe this calculation in more detail. At block 1490 the variable, INDEX, is assigned the starting value of the product value range (PMIN). Also, "price" is initialised to zero. Test 1500 commences a loop, where every index point in the product range is traversed. Block 1520 calculates the pricing value returned by the potential counterparty's pricing function, PRICEFUNC, as stored in (PRICEFUNC(SID)), at the current index point, and stores the value in P1. Block 1530 determines the pay-off amount required by the ordering party at the current index point and stores this value in P2. At block 1540, the total price at the current index point is calculated by multiplying P1 by P2. This value is added to the running total stored in

PRICE(SID). At block 1550, the index counter (INDEX) is incremented by the product step size (PSTEP), and flow returns to the test 1500. When the end of the product range has been reached (PMAX), flow proceeds to block 1510, where the calculated price bid is modified by the following calculation:

$$PRICE(SID)=PRICE(SID)*E\text{-}C/EDXCHANG(SID)$$
$$*E\text{-}CXCHANG(SID)*E\text{-}NCXCHANG(SID).$$

Returning to block 1430, the price bid stored in PRICE(SID) will be in the applicable product's consideration/entitlement denomination, currency denomination, and national currency denomination. The following steps (block 1430-1470) determine and apply the applicable discount rate to the calculated price bid (currently in future value terms) to yield a price bid in present value terms. This is done as follows: At block 1430 the number of days to product maturity is determined. Block 1440 initialises the loop counter and discount rate divisor. For each day (or appropriate part thereof) between the current date/time and the product maturity date/time, the divisor is changed according to the formula (block 1460):

$$DIV=DIV*(1+((DR(SID)/100)/365))$$

At block 1470, the price bid is adjusted according to the formula:

$$PRICE(SID)=PRICE(SID)/DIV$$

Once the price bid in present value terms is known, the potential counterparty's defined commission is added to the price (block 1480). Given that CR(SID) is a percentage commission rate, the formula is:

$$PRICE(SID)=PRICE(SID)+((CR(SID)/100)*PRICE(SID))$$

When test 1410 confirms that every potential counterparty has been priced, program flow continues at 1255.

The test at 1255 checks whether the order was a "quote only" order. If so, flow continues at block 1256 where one or more of the counterparty bid prices are selected. At block 1230, the ordering party is informed of the pricing information gathered. If the order was not a quote order (that is, it was a real product order), an attempt is now made to identify a counterparty from the potential counterparty short list matching the requirements of the current order. This is done at block 1260. Blocks 1560 to 1616 in FIG. 15 describe this process in detail.

Starting at test 1560, a check is made to ensure the potential counterparty shortlist is not empty. If it is, no match is possible and flow continues at block 1612. At this point SID is assigned "0" to indicate that no counterparty was selected from the potential counterparty short list, before moving to block 1614 where the entire order (as no part was matched) is queued. When the list is not empty, program flow continues at block 1570, where the lowest priced counterparty is selected from the counterparty short list. This determination is done based upon each potential counterparty's bid price (PRICE(SID)), being converted to the consideration/entitlement type, currency, and national currency consideration "payment" denominations sought by the ordering party (that is, PRICE(SID)= PRICE(SID)*C-C/EDXCHANG(SID)*C-CXCHANG(SID)*C-NCXCHANG(SID)). The counterparty identification is stored in SID, and its price offer is stored in BPRICE. At block 1580, the following check is made:

BPRICE>MAXCONSID

If the selected price is greater than the ordering party's specified maximum consideration payment (MAXCONSID) limit, a match with the current potential counterparty is not deemed possible. This must also be true for any of the remaining counterparties in the counterparty short list. This part of the matching process returns without any potential counterparty in the short list having been selected for a match (block 1612). Otherwise, the current price is acceptable, and the process proceeds to attempt a match with the current selected counterparty.

The next step (block 1590), requires all the applicable contract, product, and portfolio absolute loss, expected loss, expected value limits, and maximum composition limits to be read from the PSEL LIMIT master file (block 1600) and stored in ALL1(SID), ALL2(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), EVL1(SID), MC(SID) and MCC(SID). The current absolute and expected losses accumulated are also read and stored in CAL2(SID), CEL2(SID), CEL3(SID), CEL4(SID), and CEL5(SID). The ELFUNC(SID) and EVFUNC(SID) values are also set for use when calculating the expected loss and expected value for the current order. Block 1602 calculates the price of the order entitlement function using the counterparty product expected loss and expected value parameters ELFUNC(SID) and EVFUNC(SID). The order's expected loss is stored in EL(SID); the order's expected value is stored in EV(SID). The absolute loss function is also determined at block 1602 and it is stored in AL(SID). Proceeding to block 1604, the portion of the order which will not violate the counterparty limits is calculated. This check is made at test 1606. If no part of the order is matched, process flow continues at block 1608. The potential counterparty is removed from the counterparty shortlist.

If some portion of the order is matched with the current counterparty, processing continues at block 1610. Here the SID is set to the identification of the matching counterparty. The unmatched portion (if any) is stored at block 1614 as a new order in the PORD QUEUE masterfile (block 1616). Flow then returns to test 1261 in FIG. 11. When a match occurs, program flow returns to block 650. The matched order must now be confirmed by carrying out a number of additional steps, as shown in FIG. 16, blocks 1620 to 1641. If no match occurred, processing of the current order steps, and program flow returns to the beginning via connector "A". The system is ready to load the next available order. Matched Order Confirmation

For matched orders to become a contract, a number of additional actions are required. First, at test 1620, a check for manual authorisation is made. If required, program flow moves to block 1621 where authorisation requests are sent to the relevant stakeholders. Block 1623 then tests the replies for any rejections. If one or more rejections were received, program flow continues at block 1627 where the order is rejected. Otherwise, flow continues at 1624. Block 1624 effects the consideration payment by creating transactions in the payment shadow file (PAYACC SHADOW—block 1625). However, this may fail if the accounts specified do not exist or if at least the required consideration amount is shown not to be available. Test 1626 checks that "consideration payment" was effected successfully. If "consideration payment" fails, the matched order is rejected (block 1627), with details stored in the rejected order master file, PORD REJ (block 1628).

The ordering party is then informed of this event at block 1640.

With successful payment, program flow proceeds to block 1630 where the counterparty's current accumulated absolute and expected loss figures are updated (masterfile PSEL LIMIT—block 1631). At block 1632, the order data field OPRICE is set to the price given by the counterparty PRICE(SID), and SPRICE set to the counterparty's identification, SID. At block 1634, the matched order is certified as confirmed, with full details recorded in the masterfile PORD CONF (block 1636). The next step, block 1638, reports details of the newly created contingent contract to all stakeholders concerned. Program flow then returns to the beginning, via connector "A". The system is now ready to start processing the next order submitted by a specified ordering party.

6. Life Cycle of Risk Management Contract:

EXAMPLE III

The third example of a risk management contract describes a contract to manage risk associated with potential future movements in the value of a specified index of share prices (termed the PTSE 75 index). In summary, the example shows how the system could enable one party (such as an institutional fund manager) seeking to avoid the adverse consequences of a significant decline in the future value of the PTSE 75 index (specifically a decline by June 1996, relative to the assumed current (June 1991) value of the index) to make a contract with another, as-yet-unknown, party, such as another fund manager seeking to avoid the adverse consequences of a significant corresponding increase in PTSE 75 index value.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to a compensatory Australian dollar future payout upon payment of a calculated up-front consideration money amount by the ordering party to the as-yet-unknown counterparty. The future money entitlement is contingent on the value, at contract maturity date, of the independently-determined value of the PTSE 75 index.

In this example, the relevant key stakeholders are: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself); various product ordering parties (the relevant ones for the example being Abbotts & Taylor and Shearer & Associates); various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc); a counterparty guarantor (CNZ Banking Corporation); and an application regulator (the Pacific Central Bank).

The timeline depicting the steps in the contract from the first step (Application Specification) to the final step (Contract Settlement) is shown in FIG. 17. FIGS. 60A to 72B are thirteen detailed explanatory charts supporting FIG. 17. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 60A and 60B, it can be seen that BLC Inc established a Contract APP (Application ID 001) on 91.06.03.17.00.00 (that is, 5 pm on Jun. 3, 1991) to deal with economic risk management. Application ID 001 supports a range of products (Applicable Product ID's 10020-11400).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 61A and 61B, it can be seen that BLC Inc was also Product Sponsor of Product 10061 at the same time (91.06.03.17.00.00). This Product relates to the Market termed Stock Indices and to the Sub-market termed PTSE 75. The maturity date for Product 10061 is 94.06.03.17.00.00.00. The consideration for a specific contract involving Product 10061 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is also in the form of commercial bank deposits denominated in Australian dollars, payable (if necessary) immediately after the Product's specified maturity date/time.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two entities, Abrahamsons and Carpenters Inc, acting as potential counterparties for forthcoming primary product orders dealing with Product 10061. At this point in the timeline (95.01.01.17.00.00.00), 19 months after the specification of Product 10061, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification), in conjunction with FIGS. 62A and 62B, it can be seen that an Ordering Party, Abbotts & Taylor, is seeking a contract, from an offering party, in Product 10061 at that time (95.01.01.17.37.06.00). FIGS. 62A and 62B show the specific parameters (entitlement) that Abbotts & Taylor has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 54,000 (denominated in commercial bank, Australian dollars).

In order to provide a more detailed explanation of the following fifth to seventh steps in the timeline, selected processing block numbers from FIGS. 8-16 will be referred to in brackets as follows: "[ ]".

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 63A and 63B, it can be seen that Abrahamsons' specified pricing parameters, as set at 95.01.01.17.37.06.06 are used to price the Abbotts & Taylor order at 95.01.01.17.38.02.00. Abrahamsons' pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 26 [1240]. As is shown, this ID in turn implies a Commission Rate of 1.25%, a Discount Rate of 10.00% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example 1, this results in a Contract Bid Price of 51,920 (denominated in commercial bank, Australian dollars), which Abrahamsons' parameters calculate will yield them a base margin on the contract of 4,580 (again denominated in commercial bank, Australian dollars) [1250].

Still looking at the fifth step in the timeline, in conjunction with FIGS. 64A and 64B, it can be seen that Carpenters Inc specified pricing parameters, as set at 95.01.01.17.37.06.00, are also used to price the Abbotts & Taylor order at 95.01.01.17.38.02.00. Carpenters Inc's pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 17 [1240]. As is shown, this ID in turn implies a Commission Rate of 1.30%, a Discount Rate of 9.80% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results in a Contract Bid Price of 53,050 (denominated in commercial bank, Australian dollars), which Carpenters Inc's parameters calculate will yield them a base margin on the contract of 5,610 (again denominated in commercial bank, Australian dollars) [1250].

Again, still looking at the fifth step in the timeline, in conjunction with FIGS. 65A and 65B, it can be seen that Abrahamsons' pricing-related parameters (also set at 95.01.01.17.37.06.00) for determining the acceptability of ordered-contracts on the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are satisfied by Abbotts & Taylor's order [1604]. From Abrahamsons' perspective, this qualifies Abbotts & Taylor's order for inclusion in their product/contract portfolio, as long as Abrahamsons' consideration price bid turns out to be lower than Carpenters Inc's price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, in its order specification (FIGS. 62A and 62B), it is prepared to pay.

Finally, still looking at the fifth step in the timeline, but now in conjunction with FIGS. 66A and 66B, it can be seen that Carpenters Inc's pricing-related parameters (set at 95.01.01.17.37.06.00) for determining the acceptability of ordered-contract oil the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are also satisfied by Abbotts & Taylor's order. Now, from Carpenters Inc's perspective, this qualifies Abbotts & Taylor's order for inclusion in their product/contract portfolio, in this case, as long as Carpenters Inc's consideration price bid turns out to be lower than Abrahamsons' price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, in its order specification (FIGS. 62A and 62B), it is prepared to pay.

Looking at the sixth step in the timeline (Order Matching), it can be found that Abrahamsons' price bid of 51,920 is below Carpenters Inc's bid of 53,050 and, in turn, that the 51,920 amount is below Abbotts & Taylor's specified maximum consideration price of 54,000. This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons' at 95.01.01.17.38.07.00 [1260].

The seventh step in the timeline (Order/Contract Confirmation) takes place five seconds later at 95.01.01.17.38.11.00, after the system has determined that Abbotts & Taylor is able to (and then does) immediately pay the required consideration funds amount of 51,920 to Abrahamsons [650].

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 67A and 67B, one can see a contract valuation report for Abbotts & Taylor published nearly six hours after confirmation of the contract, that is, at 95.01.01.23.00.00.00. As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1970 (with a standard deviation of 333), which implies that this contract has an expected future value of 53,000 commercial bank-denominated Australian dollars (with a standard deviation of 21,160). On FIGS. 68A and 68B one can see in the equivalent report for Abrahamsons that their required expected future entitlement payout is identical to Abbotts & Taylor's expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Secondary Order Specification), detailed on FIGS. 69A and 69B, occurs nearly six months after the above-described contract valuation event; that is, at 95.06.06.08.00.00.00. At this time, Abbotts & Taylor is seeking to sell its position in the contract which was matched/confirmed at 95.01.01.17.38.11.00 (and at that time assigned the Order ID of 9156515800 by the system) at a price better than 57,000. Shearer & Associates is prepared to pay 60,000 (commercial bank deposit-denominated Australian dollars) for this position. In all other respects the contract's attributes remain unchanged. On FIGS. 70A and 70B, the tenth step in the timeline, a contract sale is seen to have occurred at a price of 58,300, just below the above-described 60,000 upper limit purchase-price amount specified by Shearer & Associates. This amount is the current best estimate of the contract's expected future value, with the standard deviation of this expected future value calculated by the system, utilizing other recent transaction data, as being 10,610. Shearer & Associates has now formally taken the place of Abbotts & Taylor as a stakeholder to the contract.

The eleventh step in the timeline (Contract Valuation) refers to a contract valuation report published for Shearer & Associates seven months later, at 96.01.01.17.00.00.00 (see FIGS. 71A and 71B). As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1800 (with a standard deviation of 283), which implies that this contract now has an expected future value of 162,360 commercial bank deposit-denominated Australian dollars (with a standard deviation of 35,160). This is an increase in expected future value of 104,060 for Shearer & Associates since the former valuation date/time. The above described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The twelfth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 96.06.03.17.00.00.00. As can be seen on FIGS. 72A and 72B, this product value of the PTSE Index was specified by BLC Inc (as Product Sponsor) to be 1820, implying a contract value of 187,200 (commercial bank deposit-denominated Australian dollars) to Shearer & Associates, and a corresponding obligation on Abrahamsons. The figure of 1820 represents the actual value of the PTSE share price index at 96.06.03.17.00.00.00 as obtained by BLC Inc from the independently verifiable information source, the identity of which they would have disclosed at the time they first announced their sponsorship of trading in the PTSE 75 share index product.

The thirteenth step in the timeline involves the formal payment of 187,200 (commercial bank deposit-denominated Australian dollars) by Abrahamsons to Shearer & Associates (ignoring possible fee payments by one or both parties). Life Cycle of Economic Management Contract:

EXAMPLE IV

This further example of a risk management contract is an extension of Example III. More particularly, however, it is a special case of the general case of Example III, in that for a particular phenomenon the same entitlement is specified by the ordering party for each of the possible outcomes. This is a case where X=1, <<alpha>>(X) is not applicable, <<beta>>(X)=the specified non-contingent entitlement (constant), and <<gamma>>(X)=11, where "11" denotes a mathematical shape that is a straightline with respect to the 'outcome' axis, drawn from a menu of such shapes. Put another way, the gradient of the graph of entitlement (y-axis) against outcome (x-axis) is zero.

The counterparty registering data remains the same as for Example III. It can be thought of as the scenario where the outcome is not of concern to the ordering party. When its future entitlement is positive, the contract, from the ordering party's view, is in the nature of a loan, in that the consideration is made available now for a future known entitlement. It is of course possible for the consideration and entitlement to be negative so that the nature of the contract from the ordering party's viewpoint is borrowing.

The example shows just this situation, in that one party (such as an institutional fund manager) seeks to avoid the adverse consequences of not having immediate possession of a defined resource (say, Australian dollars) by becoming a party to a contract with another, as-yet-unknown, party (such as another fund manager seeking to avoid the adverse consequences of being unable to adequately utilise the defined resource).

The specific contract offering is one which provides an ordering party with a specified non-contingent obligation (that is, a negative future entitlement) to make an Australian dollar future payout to the contract's counterparty upon that counterparty's payment of a calculated up-front consideration money amount to the ordering party.

Thus, for a given guaranteed entitlement payout amount by the ordering party to its counterparty on a contract's maturity date, the up-front consideration payment is essentially a function of two matters implicitly determined between the ordering party and the counterparty registering data:

1. The discount (interest) rate applicable to the contract (this will itself be credit risk-free Australian dollar instruments with the same maturity date, plus a margin reflecting the counterparty's assessment of the likelihood of default by the ordering party in making their required future entitlement payment in Australian dollars);
2. The counterparty's sought-after commission on the transaction.

Note that if, say, the contract entitlement is based in US dollars, the matter of the counterparty's defined forward Australian dollar/U.S. dollar exchange rate would also be relevant.

As noted, the relevant key stakeholders are the same as in Example III: an application promoter (BLC Inc); various product sponsors (the relevant one for the cxample being BLC Inc itself); various product ordering parties (the relevant ones for the example being Abbotts & Taylor and Shearer & Associates); various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc); a counterparty guarantor (CNZ Banking Corporation); and an application regulator (the Pacific Central Bank).

A timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 41 and further supported by FIGS. 73-77B.

Looking at the first step in the timeline, Application Specification, in conjunction with FIG. 73, we see that BLC Inc established a Contract APP (Application ID

001) on 91.06.03.17.00.00 (that is, 5 PM on Jun. 3, 1991) to deal with economic risk management. The application involves a pricing and matching objective function of: "minimize pre-tax consideration payment under an expected value (EV)/certainty equivalent (CE) value". Note that a negative consideration payment is allowed.

Looking at the second step in the timeline, Product Specification, in conjunction with FIG. 74, we see that BLC Inc was also product sponsor of Product 10061 at the same time (91.06.03.17.00.00). This product relates again to the market of stock indices. The maturity date for Product 10061 is 96.06.03.17.00.00.00. The submarket is the PTSE 75 stock index. The consideration for a specific contract involving Product 10061 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is also in the form of commercial bank deposits denominated in Australian dollars, payable immediately after the product's specified maturity date/time.

Looking at the third step in the timeline, Potential Counterparty Product Pricing Specifications, one can find two entities, Abrahamsons and Carpenters Inc, acting as potential counterparties for forthcoming primary product orders dealing with Product 10061. At this point in the timeline (95.01.01.17.00.00.00), 43 months after the specification of Product 10061, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline, Primary Order Specification, in conjunction with FIG. 75, it can be seen that Abbotts & Taylor is seeking a contract in Product 10061 at that time (95.01.01.17.37.06.00). FIG. 75 shows the specific parameters that Abbotts &

Taylor has defined for the contract it is seeking at this time, namely $A 83,830 for any feasible product value including a minimum acceptable contract consideration amount of ($A 55,000). The parentheses indicate that the consideration is negative. The calculated counter consideration ($A 55,000) will be paid by the counterparty to Abbotts & Taylor immediately after contract matching.

Looking at the fifth step in the timeline, Order Specification Pricing, in conjunction with FIGS. 76A and 76B, it can be seen that Abrahamsons (using the specified pricing parameters set at 95.01.01.17.37.06.00) prices the Abbotts & Taylor order at 95.01.01.17.38.02.00. Abrahamsons' pricing parameters, indicated by their defined circumstances ID of 31, require a commission rate of 1.25% and a discount rate of 10.00% pa. A particular set of component product prices together with a particular set of assessed probabilities of occurrence are specified. This results in a counter consideration of ($A 58,710), which Abrahamsons' parameters calculate will yield them a base margin on the contract of $A 1,980.

Still looking at the fifth step in the timeline, in conjunction with FIGS. 77A and 77B, it can be seen that Carpenters Inc (again using the specified pricing parameters set at 95.01.01.17.37.06.00) also prices the Abbotts & Taylor order at 95.01.01.17.38.02.00. Carpenters Inc's pricing parameters, indicated by their defined circumstances ID of 19, require a commission rate of 1.30% and a discount rate of 9.8% pa. A particular set of component product prices and a particular set of assessed probabilities of occurrence are specified. This results in a contract bid price of ($A 58,640), which Carpenters Inc's parameters calculate will yield them a base margin on the contract of $1,990.

Looking at the sixth step in the timeline, Primary Order Matching, it can be found that Abrahamsons' price bid of ($A 58,710) is above Carpenters Inc's bid of ($A 58,640) and above Abbotts & Taylor's specified minimum consideration price of ($A 55,000). This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons at 95.01.01.17.38.07.00. Before the matching formally occurs, a check is made that absolute loss, expected loss, expected value and portfolio attribute limits are not violated.

The seventh step in the timeline, Contact Maturity, refers to the actual determination of the product value at time of maturity, 96.06.03.17.00.00.00.

The eighth step in the timeline involves the formal payment of $A 83,830 by Abbotts & Taylor to Abrahamsons.

The example just described can also be thought of as a case where the market is irrelevant, and therefore there is no minimum or maximum product definition value nor product step value. This equates to there being no future outcome, rather simply a known specified entitlement that is not dependent upon the outcome of any particular phenomenon. The mathematical representation of curves or lines no longer is relevant. The counterparty counter consideration thus becomes a function only of the discount rate, commission and (if applicable) entitlement exchange rate.

Life Cycle of Economic Management Contract:

EXAMPLE V

This embodiment relates to an economic management contract (based on a variation of Example IV) and describes the formulation of an immediate exchange contract involving an entitlement of a defined $US amount in return for a to-be-determined consideration denominated in commercial bank Australian dollars.

This example is a special case of the general case of Example II in that it is independent of the outcome of any particular phenomenon. It has only a single outcome for which a single entitlement is specified by the ordering party.

Unlike Example IV, however, this case also involves a unique notion of a contract maturity date/time. This is the notion of "as soon as possible after the date/time the transaction is originated by the ordering party", implying an immediate exchange. That is, the date of maturity is now.

In this example, the offering is one which provides a contract ordering party with a specified non-contingent entitlement to receive its desired $US currency amount ($US 70,000) as soon as possible after the ordering party specifies it is prepared to immediately pay not more than $A 102,900 (as a consideration) in exchange for this US currency.

In this example, the relevant key stakeholders are: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself), various product ordering parties (the relevant ones for the example being Abbotts & Taylor), various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc), a counterparty guarantor (CNZ Banking Corporation) and an application regulator (the Pacific Central Bank).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 42, and are supported by FIGS. 78-82B.

Looking at the first step in the timeline, Application Specification, in conjunction with FIG. 78, we see that BLC Inc established a contract APP (Application ID 201) on 91.06.03.17.00.00 (that is, 5 pm on Jun. 3, 1991) to deal with economic risk management. The application involves a pricing and matching objective function of: "maximize pre-tax consideration/entitlement exchange rate". Application ID 201 supports a range of products.

Looking at the second step in the timeline, Product Specification, in conjunction with FIG. 79, we see that BLC Inc was also product sponsor of Product 11099 at the same time (91.06.03.17.00.00). This product relates to the market of immediate exchange. The maturity date for Product 11099 is "as soon as possible after transaction initiation". The consideration for a specific contract involving Product 11099 is commercial bank deposits denominated in Australian dollars. The entitlement is in the form of commercial bank deposits denominated in US dollars, payable immediately after the product's specified maturity date/time (that is, as soon as possible after transaction initiation).

Looking at the third step in the timeline, Potential Counterparty Product Pricing Specifications, two entities, Abrahamsons and Carpenters Inc, are potential counterparties for forthcoming primary product orders dealing with Product 11099. At this point in the timeline (92.06.03.15.00.00.00), 12 months after the specification of Product 11099, both Abrahamsons and Carpenters Inc have currently-

specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline, Primary Order Specification, in conjunction with FIG. 80, it can be seen that an ordering party, Abbotts & Taylor, is seeking a contract from an offering party in Product 11099 at that time (92.06.03.17.00.00.00). FIG. 80 shows the specific parameters that Abbotts & Taylor has defined for the contract it is seeking at this time, including a maximum exchange (consideration) amount of ($A 102,900) and a defined $US 70,000 entitlement.

Looking at the fifth step in the timeline, Order Specification Pricing, in conjunction with FIGS. 81A and 81B, it can be seen that the system determines that the counter consideration amount Abrahamsons judge to be ideal given their specified parameters is $A 94,500. This occurs at 92.06.03.17.38.02.00. Abrahamsons' pricing parameters specify an exchange rate of 0.75, a commission rate of 1.25% and a single assessed probability of occurrence of one (1) (discount rate and component product prices being irrelevant in this example). The counter consideration of $A 94,500 is lower than Abbotts & Taylor's specified maximum consideration amount of $A 102,900.

Still looking at the fifth step in the timeline, in conjunction with FIGS. 82A and 82B, the system determines that the counter consideration amount Carpenters Inc judge to be ideal given their specified parameters is $A 101,300. Carpenters Inc's pricing parameters imply an exchange rate of 0.70, a commission rate of 1.30% and a single assessed probability of occurrence of one (1) (discount rate and component product prices again being irrelevant).

Looking at the sixth step in the timeline, Order Matching, it can be found that the system assesses Abrahamsons' to be superior to that of Carpenter Inc and below Abbotts & Taylor's maximum consideration. This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons' at 92.06.03.17.38.12.00. Matching coincides in time with maturity, and very shortly thereafter there is the transfer of $A 94,500 from Abrahamsons to Abbotts & Taylor and a corresponding transfer of $US 70,000 from Abrahamsons to Abbotts & Taylor. This then represent finalisation of the transaction, including all the transfers involved at the date/time of maturity of other contract types.

A further embodiment, relevant to each of the embodiments of Examples III to V above, involves the order pricing procedure as before, followed by a step of obligating the ordering party with the would-be matched counterparty for a period of time before the match is formally made. As before, the consideration can be payable immediately upon match or deferred for a time (even up until maturity), and the date of maturity can be at a future time from matching (or even immediately upon match). The period of obligation can be specified by the promoter stakeholder, and thus be known to the ordering party and the registering counterparties. The period of obligation thus enables parties to contract to future contingent contracts (in the case of Examples I and IV) or future exchange (in the case of Example V).

7. Description of Consideration/Entitlement Payment Process

The purpose of the CONTRACT APP consideration/entitlement (and related transactions) payment/receipt process is to effect debits and credits to INVENTCO stakeholder accounts, typically at maturity of a contract, with participating consideration/entitlement transfer (or exchange) entities, reflecting payment/ receipt entitlements and obligations originated within INVENTCO. The process effects these payments/ receipts in a two-stage process. First, by debiting/ crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts with a participating consideration/entitlement transfer entity (C/E entity), external to INVENTCO, with which they maintain an account. And second, by periodically effecting, via existing and potential payment mechanisms, corresponding payment instructions to the payment entities concerned. Details of the above-described mechanism are as follows.

All INVENTCO stakeholders maintain (a minimum of) two special-purpose (net-credit balance only) accounts with (at least) one selected, VIRPRO authorised, C/E transfer entity. The purpose of special-purpose accounts is to ensure that only INVENTCO-initiated debits and credits are capable of being effected to the accounts. Thus, at any time the balance of each PAYACC SHADOW file account record should be equivalent to the true, but usually unknown, time-of-day balance of the actual account maintained by the C/E transfer entity.

The purpose of two accounts is to enable only credits to be effected through one account and only debits through another account. And the purpose of "net-credit balance only" accounts is to ensure that accumulated debits to the debits-only account never exceed the account opening balance plus accumulated credits to the credits-only account.

C/E transfer entities will typically be (but do not need to be) institutions of any/all of six types:

public/private record-registries of various types; credit card companies (typically for retail transactions only); commercial banks; central banks; taxation authorities; and non-bank clearing houses and depositories.

The resources transferred by these entities may be of any type. However, most typically, they will be deposits appropriate for the entity concerned: With respect to public/private record-registries—entitlement deposits (including shares in financial or physical assets, participation rights in wagers, and so on). With respect to credit/debit card companies—normal card company deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to commercial banks—normal bank deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to central banks— exchange settlement account (or equivalent) deposits. With respect to taxation authorities—taxation account deposits. And with respect to non-bank clearing houses and depositories—deposits of financial instruments, precious metals and the like. CONTRACT APP potential counterparties will also effectively be C/E transfer entities, as will ordering party guarantors (external to INVENTCO) where they offer credit to product ordering parties. Also, some accounts will be trust accounts maintained on behalf of potential counterparties (and some product ordering parties) involved in applications requiring the periodic payment of collateral to independent third parties to serve as an additional security device.

Immediately after the completion of its daily—or more frequent—transaction processing, and their associated settlement functions, each C/E transfer entity electronically notifies the applicable CONTRACT APP of the "opening balances" of all the debit and credit INVENTCO accounts it maintains (At this stage, the debit account balance should be zero and the credit account balance should be greater than or equal to zero). Where an INVENTCO stakeholder has an overdraft or line-of-credit with its C/E transfer entity, the credit value of this will be reflected in the non-zero balance of its credit account at this time.

Upon receipt of the above-described notifications, the applicable CONTRACT APP updates/confirms its stakeholder shadow balances. Thus, at this point-in-time, all credit and debit shadow account balances should be equivalent to their actual debit and credit account balances.

Progressively throughout the day (where "day" here is likely to be different for each C/E transfer entity due to a combination of differences in the time-zone locations of payment entities in relation to the applicable CONTRACT APP, and the likely different account processing cycles of these entities), INVENTCO-stakeholder—authorised 15 debits and credits to INVENTCO stakeholder shadow accounts are effected on a real-time basis—debits to debit accounts and credits to credit accounts. At all times, the CONTRACT APP ensures that the cumulative debit balance of each stakeholder's debits account does not exceed the "opening balance" plus the cumulative credit balance of the stakeholder's credit account. Thus, at any time, for every INVENTCO stakeholder, the combination of each stakeholder's debit account and credit account will represent the "true", net, time-of-day value of the stakeholder's two actual special-purpose accounts maintained external to INVENTCO.

Debits and credits to INVENTCO stakeholder accounts are effected according to strict rules and conditions, being different for credits and debits.

Credits can be made to any INVENTCO stakeholder's credit account with its nominated C/E transfer entity by any other INVENTCO stakeholder for any reason. Naturally, as INVENTCO stakeholders will not know the account details of other stakeholders, such credits will be effected either automatically, according to information and rules known by the applicable CONTRACT APP, or semi-automatically by way of an INVENTCO stakeholder requesting from VIRPRO, as they need to do so, a credit-account number of the stakeholder to which they wish to transfer assets. This account number may only be valid for a nominated period and would not typically be the specified stakeholder's actual account number with its nominated consideration/entitlement transfer entity—it would only be a reference to an INVENTCO file containing this number.

On the other hand, debits can only be made to an INVENTCO stakeholder's debit account with its nominated C/E transfer entity by the stakeholder itself, and by other stakeholders explicitly granted this right by each stakeholder, subject to these other stakeholders exercising this right according to the rules and conditions specified for them.

Where an INVENTCO stakeholder seeks to initiate/authorise debits to its nominated account(s) on its own, this can only be done through the stakeholder satisfactorily completing the identification and security procedures set down by their C/E consideration/entitlement transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). The type of procedure set down by all participating C/E transfer entities involves (at least) the following: First, the consideration/entitlement transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts, and a similarly confidential "black box" which, by initiating any of a number of possible proprietary password request-response processes involving any one of its customers possessing the appropriate device(s), confirms that remote messages received from that customer, and processed by the "black box", are authentic. Second, the consideration/entitlement transfer entity supplying their INVENTCO customers with a programmable smart card (or equivalent device) enabling each customer, remotely—via telephone or direct computer line, to unambiguously confirm their identity with their INVENTCO-maintained account, thereby having the capability to authorise debits to their account within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on. Third, INVENTCO providing the mechanisms for direct, confidential, stakeholder communications with their C/E transfer entity shadow debit accounts, and the formal updating of these accounts, through non real-time processes, utilizing the unique time-stamped reference numbers created as/when stakeholders authorise access to their account records.

Where an INVENTCO stakeholder has authorised other INVENTCO stakeholders to initiate debits to (any of) its nominated account(s) according to a standing authority of some type, this can only be done through the authorised stakeholder itself satisfactorily completing the identification and security procedures set down by the authorisation-granting stakeholder's nominated C/E transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). Once again, the type of procedure, set down by all participating C/E transfer entities in this respect, involves (at least) the following: First, the C/E transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts and each other INVENTCO stakeholder which has been authorised to effect debits (within defined parameters) to these accounts. Second, the C/E transfer entity supplying VIRPRO with a similarly confidential black box which, by initiating any of a number of possible proprietary password request-response processes involving an entity nominated by any of its customers possessing the appropriate device(s), confirms that remote messages received from that authorised entity, and processed by the black box, are authentic. Third, the C/E transfer entity supplying their INVENTCO customers with a collection of programmable smart cards (or equivalent devices), for distribution to these authorised entities, enabling each authorised entity, remotely—via telephone or direct computer line—to unambiguously confirm their identity with the customer's PAYACC SHADOW account, thereby having the capability to authorise debits to this account (again, within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on). And four, INVENTCO providing the mechanisms for direct, confidential, authorised stakeholder communications with a stakeholder's C/E transfer entity shadow debit account(s).

At the end of each C/E transfer entity's specified day (or part of a day), the applicable CONTRACT APP transfers (at least) two things to the entity: First, if required, a series of figures representing the exchange settlement (or equivalent) accounting entries it has or will communicate to the C/E transfer entity's appropriate clearing authority (for each of the applicable consideration/entitlement denomination, currency and national currency types of the payments/receipts involved) where these figures represent the balancing net debit or credit figure corresponding to the aggregation of all of the entity's INVENTCO customer transactions in the prior day. And second, a detailed file of all customer transactions effected during the day (corresponding, if required, to the above-described net figures). Upon their receipt of these transactions and summary figures, the C/E transfer entity then debits/credits each transaction to the appropriate actual customer accounts, enabling new "closing" account balances to be calculated (these "closing" balances should be exactly the same as the end-of-day balances communicated by the applicable CONTRACT APPS with it's file of customer transactions). In turn, these "closing balances" become the C/E transfer entity's account "opening balances" for the next day. The CONTRACT APPS notification process then repeats itself.

Where applicable, at days-end for the "clearing house" of clusters of like C/E transfer entities (for example, a national central bank), CONTRACT APP transfers netted exchange settlement accounting entries to the clearing houses concerned. These entries serve to "balance the individual customer account entries transferred to each associated C/E transfer entity individually.

8. INDUSTRIAL APPLICABILITY

The invention has industrial application in the use of electrical computing devices and data communications. The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices. The types of events associated with the risk management apparatus and methodologies includes physical and technical phenomena, and therefore have value in the field of economic endeavour.

Glossary of Key Terms

Alpha (X)

The Ordering party-specified event value corresponding to the Xth future product event value contract entitlement payoff (payout) inflection point.

Application Promoter

An entity authorised by VIRPRO that specifies and administers defined rules and regulations underlying a defined CONTRACT APP—including the specific products offered for trading; categories of, and conditions of involvement, of stakeholders; nature of involvement and dispute resolution procedures of stakeholders.

Automatic/Manual Deal and No Deal Flags

Indicators notified by each stakeholder to CONTRACT APP specifying the manner in which that stakeholder wishes to deal with each other stakeholder.

AXSCO

A communications co-ordination and security system, linked to all stakeholders and component applications.

Base Pricing Probabilities

The prices set by sellers for unit entitlement payoffs of a contract at each of its possible future index values denominated in the contract's formally specified consideration/ entitlement, currency and national currency.

Beta (X)

The Ordering party-specified desired entitlement payoff (payout) amount in the desired currency denomination of contract entitlement payout (payoff) and national currency denomination of contract entitlement payout (payoff) corresponding to the Xth event value inflection point.

Bilateral Obligations Netting Indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all pairs of participating stakeholders are to be netted.

Bilateral Payments Netting Indicator

An indicator that individual end-of-day gross payments/receipts to/from all pairs of participating INVENTCO stakeholders are to be netted.

Commission Rate

The minimum required percentage profit margin required by a Potential Counterparty above the "breakeven" bid price for an Ordering party purchase order.

Consideration/Entitlement Transfer Entity

An entity acceptable to VIRPRO and the Application Promoter, satisfying defined minimum standards of financial strength, credit standing and integrity, able to maintain Consideration/entitlement accounts on behalf of stakeholders and effect transfers of those assets as directed.

CONTRACT APP Stakeholder Types

Expected stakeholder types are Application Promoter, Product Sponsor, Product Ordering party, Counterparty, Counterparty-Guarantor, Regulator, Consideration/ entitlement Transfer Entities and Miscellaneous other parties.

Contract and Product "Absolute Loss" Limit

A value limit specified by a potential counterparty of the maximum absolute loss it is prepared to sustain on a contract/ product irrespective of the assessment of the likelihood of any particular level of possible loss being incurred.

Contract and Product "Expected Loss" Limit

A value limit specified by a potential counterparty of the maximum expected loss it is prepared to sustain on a contract/product based on the counterparty's assessment of the likelihood of all levels of possible loss being incurred.

Contract Authorisation

A process of verifying that an Ordering Party product purchase order contains data appropriate to the product being sought and that the Ordering Party is accurately identified and credential led.

Contract Collateralisation Indicator

A descriptor set by the Application Promoter specifying whether and on what basis, counterparties may be required to periodically transfer assets/ monies (collateral) to an independent trust fund to ensure they will be able to meet their potential entitlement payoff obligations on the maturity date of a contract.

Contract Confirmation

The process of securing the positive agreement of all affected stakeholders to a purchase order, including acknowledgement by the relevant Consideration/ entitlement transfer entity of the Ordering party's ability to pay the required product consideration and fees, either automatically or through manual approvals.

Contract Matching

See Ordering party/Potential counterparty matching process.

Contractual Obligation

a. A binding commitment one entity (or group of entities) has to provide products or services or information to another entity (or group of entities) in exchange for an agreed quantity of other products, services or information.

b. A binding commitment all entities have to the network and general management system entity VIRPRO and thus to each other, to accept constraints on their activities imposed by other authorised entities on terms specified and agreed to by them as a condition of their participation in one or more of the component systems.

Contract Portfolio Netting

A term used to describe the process of "setting-off" or "netting", the future payment entitlement obligations between Ordering parties and Counterparties, either bi-laterally or multi-laterally.

Currency and National Currency Exchange Rates

The rates used to convert contract consideration/ entitlement currency and national currency requirements into the product's consideration/entitlement currency and national currency denomination.

Deal Flag

An indicator or "flag" notified to CONTRACT APP signifying that the stakeholder is satisfied to deal unreservedly with the stakeholder against whom the flag has been set.

Defined Circumstances

The possible combinations of the categories of product-order information provided by Ordering parties.

Defined Probability Distributions

A set of pricing probability parameters specified by an Ordering party and including at least, a probability distribution type identifier, the expected value of the distribution, the standard deviation of the distribution and a probability distribution adjustment value or function.

Desired Currency Denomination of Contract Entitlement

A term indicating the currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired Currency Denomination of Consideration Payment

A term indicating the currency in which an Ordering party wishes to pay the required consideration for the contract sought.

Desired National Currency Denomination of Contract Entitlement

A term indicating the National currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired National Currency Denomination of Consideration Payment

A term indicating the National currency in which the Ordering party wishes to pay the required consideration for the contract being sought.

Discount Rate

The rate used to determine the present value of a potential counterparty's expected future entitlements.

Entitlement

The payout expected by the offering party at maturity as specified for each outcome in the range of outcomes. The payout can be both positive and negative in value over the range of outcomes, and can be in the form of money or other non-money types of goods, services, promises, credits or warrants.

EV-CE Pricing

A price discovery mechanism for primary contracts meaning "expected value certainty equivalent pricing" being the calculated expected present value or future value of the contract.

Expected Value

A function in EV-CE pricing which means the sum of the products of all possible contract entitlement payoff/payout amounts and the Ordering party's/ Counterparty's assessment of the probability of occurrence of the future events which would contractually give rise to these entitlement payoff amounts.

Expected Value Limits on a Counterparty's Aggregate Product Portfolio

Optional value limits specified by a Potential counterparty at any one time, where time can be specified in terms including "equivalent maturity date"; "same-month maturity date" and "all possible maturity dates" including product expected loss limits and maximum (and possibly minimum) proportion of the expected total loss of the aggregate of the Counterparty's product portfolio that can be accounted for by the expected loss on the individual contract/product.

Gamma(X)

The Ordering party-specified desired shape of the function between each of the coordinates Alpha(1), Beta(1) and Alpha(2), Beta(2) and so on; such that Gamma can represent all possible mathematically definable shapes.

I-INVENTCO

The infrastructure component of INVENTCO.

INVENTCO

A collection of one or more (potentially interrelated) systems, where each system is the combination of a telecommunications, computing and other forms of infrastructure, and a variety of markets and support services distributed by this infrastructure.

M-INVENTCO

A depository of VIRPRO authorised "markets" application software.

Manual Deal Flag

An indicator or "flag" notified to CONTRACT APP by a stakeholder signifying that the stakeholder wishes to manually approve a transaction involving the other stakeholder against whom the flag has been set.

Multilateral Payments Netting Indicator

An indicator that individual end-of-day gross payments/receipts to/from all participating stakeholders from/to a specified third party trustee/clearing entity are to be netted. Multilateral Obligations Netting Indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all participating stakeholders from/to a third party trustee/clearing entity are to be netted.

Negative Contract Payoffs

A type of contract in which the contract Ordering party may have a contingent payoff to the contract's Potential counterparty (i.e. the reverse of a normal contract).

No Deal Flag

An indicator or "flag" notified to a CONTRACT APP by a stakeholder signifying that the stakeholder does not wish to deal in any way with the other stakeholder against whom the flag has been set.

Ordering Party Contingent Claims Function

Specifications of a product payoff or a mathematical function to calculate an Ordering party's product payoff requirement.

Portfolio Product "Expected Loss" Limit

A value limit, specified by a potential Counterparty, of the maximum expected loss the potential Counterparty is prepared to sustain on its product portfolio based on the Counterparty's assessment of the likelihood

of all levels of possible loss being incurred.
Product Ordering Party

An entity acceptable to VIRPRO and the Application Promoter, interested in and able to acquire a CONTRACT APP product.

Product Establishment Date/Time

The date/time an Application Promoter first offers a defined product for trading.

Product Future Event Value "Density" Indicator

An indicator specifying the number of intermediate points between the minimum and maximum future event product definition values specified for the product by the Application Promoter/Product Sponsor.

Product Event Value "Width" Indicator

An indicator specifying the range (minimum-maximum) of future event values accommodated by the product as set by the Application Promoter/Product Sponsor.

Product Future Event Value

A term used to indicate the actual value of a defined product at its date/time of maturity.

Product Maturity Date/Time

The date-time at which the Application Promoter is required to make a determination of the actual event value to enable entitlement and related payoffs on successful contracts.

Product Price Quote Requests

A type of product purchase order for which the matching process is terminated and the result communicated to the Ordering party, when a desired price bid or range of price bids has been obtained.

Product Purchase Orders

Specific product purchase orders for which the Ordering party is seeking a potential Counterparty match, which may be of three types: automatic orders; manual orders and "hide" orders.

Product Purchase Order Withdrawals

Ordering party-initiated requests to withdraw from processing pre-submitted but as yet unconfirmed product purchase orders.

Product Potential Counterparty

An entity acceptable to VIRPRO and the Application Promoter, exceeding a defined minimum standard of financial strength, credit standing and integrity, offering defined CONTRACT APP products to product Ordering parties.

Product Sponsor

An entity acceptable to VIRPRO and the Application Promoter, having responsibility for detailed definition of product parameters including the continual determination of product values over time.

Regulator

An entity acceptable to VIRPRO having local, state, national or international jurisdiction over one or more CONTRACT APPS.

Set of Pricing Probabilities

The range of probabilities a potential Counterparty applies to a class of Ordering party order, specified by the value of "defined circumstances" and applying to every feasible future product event defined for that product by an Application Promoter.

Stakeholder

An entity that is a registered participant in one or more of INVENTCO's component parts.

Value Dates

The respective dates/times at which matched contract consideration and entitlements are agreed to be made by the relevant Ordering party/Counterparty to a contract.

VIRPRO

The network and general management system component of INVENTCO.

"X"

A term indicating the number of contract payoff (payout) inflection points the Ordering party is seeking within the allowable range of future product event values (including the value range extremity points).

CONTRACT APPS

Overview

CONTRACT APPS is a term used to refer to certain types of units of applications software which can, but do not need to, reside within an INVENTCO system's (M-INVENTCO) depository of "markets" software. The purpose of individual CONTRACT APPS is two-fold: First, to effect the trading/exchange/transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trades/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through to their time of maturity, including their ultimate settlement.

Individual CONTRACT APPS perform theses tasks according to the specific rules they embody, defined by their own stakeholders. CONTRACT APPS effectively reside upon AXSCO and within M-INVENTCO.

Stakeholder Types

CONTRACT APPS accommodate eight (and potentially fewer) generic types of their "own" stakeholders (as distinct from other INVENTCO stakeholders) termed: application promoter, product sponsors, product ordering parties, potential product counterparties, counterparty-guarantors, regulators, consideration/entitlement transfer entities, and other miscellaneous parties.

Some details of these stakeholders are as as follows: an application promoter is an entity having overall responsibility for the functioning of a CONTRACT

APP (that responsibility having been granted by VIRPRO); a product sponsor is an entity which promotes and administers the rules of trading, and subsequent management, of defined contingent claims contracting product(s) selected for inclusion in a CONTRACT APP by its application promoter; a product ordering party is an entity seeking to acquire a CONTRACT APP product from a potential product counterparty (where a product ordering party can also be a product counterparty); a potential product counterparty is an entity potentially prepared to satisfy the CONTRACT APP product needs of a product ordering party (where a potential product counterparty can also be a product ordering party); a counterparty-guarantor is an entity guaranteeing a product counterparty's ability to settle any/all of its potential entitlement transfer obligations to a product ordering party to which it has become a counterparty as a result of a CONTRACT APP effected "match"; regulators are entities overseeing the on-going performance of all other stakeholders involved in a CONTRACT APP, especially counterparty-guarantors; consideration/entitlement transfer entities are entities with which all other CONTRACT APP stakeholders maintain "accounts" to transfer required considerations/entitlements to/from all each other; and miscellaneous parties are all other entities having a defined stake in the functioning of a CONTRACT APP.

Miscellaneous parties include: independent entities contracted by application promoters or product sponsors to formally determine the "value" of products on their date-of-maturity; multilateral obligations and payment netting trustee/clearing entity organisations; independent (non-regulator) taxation and other governmental authorities; electronic "gateway" providers (external to INVENTCO); and host system organizations (in the case of CONTRACT APPS within INVENTCO systems linked to a common host system). CONTRACT APPS accommodate any number of their own stakeholders of each of the above-defined generic types.

Product Types

CONTRACT APPS can support risk aversion contract "product types" with any combination of values of multiple attributes, including: the fundamental nature/purpose of the product; the establishment/maturity date/time of the product; the consideration/entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/entitlement identifiers associated with the product; the "width" and "density" identifiers of possible future event values of the product; and miscellaneous other product descriptors.

The "fundamental nature/purpose of the product" attribute may incorporate identifiers including: a conditional entitlement-payoff dimensioins identifier; a market identifier; a sub-market identifier; and a market-type identifier. The "conditional entitlement-payoff dimensions identifier" specifies the number of dimensions to an ordering party's sought-after conditional entitlement-payoffs. The market identifier specifies whether the product relates to an "actual" or "perceived" phenomenon (or phenomena), the number of such phenomena (if applicable), and the applicable phenomenon category (for example, industrial, scientific, financial market hedging, and so on). The sub-market identifier provides a more specific description of the product concerned. The market-type identifier specifies the applicable future period date/time (where this can be anything—for example, "at a defined contract maturity date/time", "at a specified time on or before contract maturity date/ time", and so on), and type-of-future event involved (where, again, this can be anything—for example, as an indicator of some relative value of a phenomenon (spot value, average value and so on), or as an indicator of the "rate-of-change" of some value of a phenomenon.

The "establishment and maturity date/time of the product" attribute specifies, respectively, the date/ time an application promoter first offered a product for trading, and the date/time at which the defined product matures (that is, the date/time at which the product sponsor is required to make a determination of the actual event value at that date/time so enabling contract entitlement transfers to be effected).

The "consideration/entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/entitlement identifiers associated with the product" attribute specify: the type of consideration/entitlement involved (where this can include rights and entitlements, physical assets, and "money" of all possible types); in the case of a "money" consideration/entitlement type, the currency of the consideration/entitlement (where such currency types can include: public/private record-depository deposits, commercial credit card company deposits, commercial bank deposits, central bank deposits, taxation authority deposits, and deposits in non-bank clearing houses and depositories, and the like); and, again, in the case of a "money" consideration/entitlement type, the national currency of the consideration/entitlement identifier (where such national currency types can be in any national currency, or form of synthetic currency).

The "width and density identifiers of possible future event values of the product" attribute specifies, respectively: the minimum and maximum values of the allowable range of future event values accommodated by a product; and the number of intermediate points between the defined minimum and maximum future event values accommodated by the product.

The "miscellaneous other product descriptors" attribute specifies such things as: the degree of stakeholder access granted the product by the application promoter in question; the forms of trading-services granted the product by the application promoter in question (where this product attribute specifies the accessibility of the product to a range of feasible "stakeholder services" with respect to such things as contract portfolio netting, contract collateralisation, consideration credit provision, ordering party ability to specify negative contract entitlements, and availability of secondary/derivative market product trading); and the degrees of trading, clearing and settlement "transparency" granted the product by the application promoter in question. Transaction Types

A range of primary, secondary, derivative-primary, and derivative-secondary risk aversion contract transactions are accommodated by CONTRACT APPS.

The range of "primary" (and derivative-primary (options, for example)) risk aversion Contract transaction-types (handled principally by Processes 2 and 4) include: ordering party product orders (and option orders) for which the ordering party is seeking a counterparty "match", ordering-part), price quote (and options price quote) requests; and ordering-party withdrawals of existing product orders (and withdrawal of options on product orders). Ordering party product orders consist of: automatic orders and manual orders. Automatic orders consist of: normal automatic orders (being orders the ordering party is prepared to have matched automatically, subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the ordering party is prepared to have matched automatically, subject to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the ordering party). Manual orders consist of normal-manual orders (being orders the ordering party wishes to manually authorise before they are finalised—that is, after a counterparty "match" has been effected but before the contract has been "confirmed"—subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have respecified); and anonymous-manual orders (being orders the ordering party wishes to manually authorise before they are finalised—that is, after a counterparty "match" has been effected but before the contract has been "confirmed" subject to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have respecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the ordering party).

The range of 'secondary' (and derivative-secondary (options, for example) risk aversion contract transaction-types (handled principally by Processes 3 and 5) include: acquiring party product orders (and option orders) for which the acquiring party is seeking to "acquire" the position of a specified "risk counterparty" stakeholder in an existing contract; acquiring-party product price indications (and option price indications); and acquiring-party withdrawals of existing product orders (and option withdrawals).

Acquiring party product orders for which the acquiring party is seeking to "acquire" the position of a specified "risk counterparty" stakeholder in an existing contract, consist of automatic orders and manual orders.

Automatic orders consist of: normal-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject only to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the acquiring party).

Manual orders consist of normal-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised—that is, after a "match" has been effected but before the contract "sale" is "confirmed"—subject only to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised—that is, after a "match" has been effected but before the contract "sale" is "confirmed"—subject to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the acquiring party).

Primary Product Pricing Process Types

CONTRACT APPS enable potential counterparties to automatically establish "bids" on any defined (primary and derivative-primary) product order according to either an "expected value/utility-certainty equivalent" (EV/U-CE) pricing regime, or any other mathematically-definable pricing regime.

In the case of an "expected value-certainty equivalent" (EV-CE) pricing regime, each potential counterparty specifies, amongst other things: an indicator of certain defined attributes of an as-yet-unknown product order; a base commission rate; a base discount rate; (if applicable) a set of base consideration/entitlement denomination, currency, and national currency exchange rates; base unit product prices; and desired adjustments to the preceding base-bid-price determinants dependent on any specific order (submitted by a specified ordering party).

The above-described indicator of certain defined attributes of an as-yet-unknown product order (termed, defined circumstances) may reflect any combination of the multiple characteristics of an order (irrespective of the ordering party concerned), including: the multiple attributes of the contingent claims function sought; the ordering party's interest or otherwise in being granted credit by a counterparty; the ordering party's interest or otherwise in participating in the possible netting and collateralisation features of the APP; and the maximum (and possibly minimum) consideration amount the ordering party is prepared to pay for their defined product. The above-described base commission rate specifies the minimum required percentage profit margin required by the counterparty above their breakeven consideration bid price for a product order.

The above-described base discount rate determines the present value of the counterparty's expected future entitlement associated with a contract (net of the ordering party's consideration, and making allowance for the future income stream this consideration is expected to generate). The above-described set of base consideration/entitlement denomination, currency and national currency exchange rates are used, where applicable, to convert an ordering party's contract requirements into the base consideration/entitlement denomination, currency and national currency of the product so enabling the contract matching process to make like comparisons of counterparty bids for product orders.

The above-described base unit product prices are prices set by potential counterparties for unit entitlement-payoffs of a contract at each of its possible future values, denominated in the contract's formally specified consideration/entitlement type and, if applicable, currency type and national currency type (where these unit prices can be specified as directly input figures for every feasible future product event (the sum of which may or may not add to 1), or as parameters of defined mathematical functions). The above-described desired adjustments to the preceding base-bid-price determinants dependent on the specific ordering party submitting a specific order can include: a commission rate adjustment; a discount rate adjustment; a consideration/denomination exchange rate adjustment; a currency exchange rate adjustment; and a national currency exchange rate adjustment.

In the case of an "expected utility-certainty equivalent" (EU-CE) pricing regime, each potential counterparty specifies all of the above-described parameters applicable to a EV-CE pricing regime as well as "utility bench-mark" figures for all possible consideration and entitlement "payment amounts" which could, conceivably, be associated with a product/contract.

Primary Product Matching Process Types

CONTRACT APPS may similarly accommodate any of a number of possible (primary and derivative-primary) order matching processes where these processes can be of multiple types, including sequential processes and simultaneous processes.

Sequential order matching processes can be characterised according to the "sequence determining" and "matching" rules they embody, where "sequence" rules may be of various types: "last-in-first-out (LIFO)", "first-in-first-out" (FIFO)", priced priority, and so on; and matching rules may also be of various type—for example, a specific matching process could seek, for each product ordering party, a counterparty (or counterparties) offering a product price at or below the maximum price the ordering party is prepared to pay (where the determined contract price could be either the lowest price offered by a potential counterparty, the mid-point between the an ordering party's specified "maximum consideration amount" and the lowest price offered by a potential counterparty, and so on); or seek for each potential product counterparty an ordering party prepared to pay the maximum price above a price at which the counterparty is prepared to deal (here, the determined contract price could be either: the ordering party's "maximum consideration amount" price, the mid point between the minimum price the counterparty is prepared to receive and the ordering party's "maximum consideration amount" price, and so on).

Simultaneous order matching processes are those seeking some type of optimum solution according to pre-defined objectives. For example: "maximise the number of ordering party-counterparty matches"; "maximize the aggregate consideration and/or entitlement value of ordering party-counterparty matches"; or "minimize the value of a function specifying the sum of the differences (possibly weighted according to their perceived importance) between the actual and desired values of match attributes of ordering parties and counterparties".

Both of the above-described sequential and simultaneous matching processes can also accommodate conditional contract matching rules; and pre and post tax price optimisation mechanisms.

Application Types

CONTRACT APPS may be: "in-house" APPS or "public" APPS; "single potential counterparty" APPS or "multiple potential counterparty" APPS; APPS with differing degrees and forms of "regulator" oversight of other application stakeholders; and APPS with differing degrees and forms of "counterparty-guarantor" oversight of product potential counterparties.

CONTRACT APPS support consideration "payment" value dates being "immediate" (meaning exactly the time at which a contract match is confirmed); or deferred until a defined time in the future, measured in terms of seconds, minutes, hours, or days. Similarly, CONTRACT APPS support entitlement "payment" value dates being "immediate" (meaning exactly the time at which the applicable application promoter formally notifies other CONTRACT APP stakeholders of the "result" of a maturing contract); or deferred until a defined time after the "result" of a maturing contract is known.

CONTRACT APPS allow contracts to be modified and liquidated after their creation. Contracts can be modified through: direct negotiation by the relevant "risk counterparties" to a particular contract; or the purchase/sale of "derivative" secondary risk aversion contract transactions (See Process 5 description below). Contracts can be similarly liquidated after their creation through sale of the contract (within or outside INVENTCO); and through direct negotiation between the initial ordering party and counter-parties to the contract. They can also be effectively liquidated through the ordering party/counterparty acquiring a mirror image of the contract to which they are a party (within or outside of INVENTCO).

Post Order Process Types

CONTRACT APPS undertake various generic types of "post-order-process" management functions for all the above-described generic types of "transactions", including: a function which maintains a formal record of contractual commitments entered into by all CONTRACT APP stakeholders with one another, and with VIRPRO-authorised entities external to either the applicable CONTRACT APP or INVENTCO overall; a function which effects the independent valuation of consideration and entitlement obligations between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects "collateralisation" consideration/entitlement transfers between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP, based on above-described valuations of consideration and entitlement obligations associated with CONTRACT APP transactions; a function which determines and effects, as required, the bi-lateral netting of accumulated "consideration/entitlement" obligations "between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, the multilateral netting of accumulated "consideration/entitlement" obligations" between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nominated third-party "clearing house" entity); a function which manages the processing, accounting, reporting, and entitlement "payment" tasks associated with maturing contracts; a function which determines system usage and access fees payable to/from all CONTRACT APP (and other INVENTCO) stakeholders, and to/from VIRPRO-authorised entities external to INVENTCO; a function which determines and effects, as required, "bi-laterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders themselves, and from/to CONTRACT APP stakeholders and

VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, "multi-laterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders themselves, and from/to CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nominated third-party "clearing house" entity); and a function which compiles and distributes CONTRACT APP (and other INVENTCO) stakeholder customised information.

Supplementary Process Types

CONTRACT APPS undertake various other types of support processes, including: enabling stakeholders to transfer consideration, entitlement and other "payment" obligations to and from one another, independently of transfers initiated by CONTRACT APP transactions (See Process 7 description below); providing CONTRACT APP (and other INVENTCO) stakeholders with shared access to specialist systems to assist them to decide how best to interface with the multiple aspects of INVENTCO (See Process 8 description below); and providing CONTRACT APP (and other INVENTCO) stakeholders with access to a range of INVENTCO-facilitated "value added services" (See Process 9 description below).

Order Matching Constraint Types

For their operation, CONTRACT APPS require all stakeholders to a specific APP to specify, amongst other things, which other stakeholders they do and do not want to have interactions with, and the conditions under which they wish to manually authorise some aspect of a transaction involving any other

CONTRACT APP stakeholder over which they have control authority of some form.

In specifying which other stakeholders they do and do not want to have interactions with, CONTRACT APP stakeholders have various options. Application promoters can specify acceptable product sponsors, products, ordering parties and potential counterparties within their application—individually and by type. Similarly, product sponsors can specify acceptable application promoters, products, ordering parties, potential counterparties and counterparty-guarantors within their application—individually and by type.

Product counterparties and ordering parties (collectively) can specify: ordering parties/potential counterparties they do and do not want to deal with—individually and by type; the extent of their preparedness to be involved in contract netting and collateralisation arrangements provided for by their application promoter; application promoters, product sponsors, products, and consideration/entitlement transfer entities they do and do not want to deal with—individually and by type; ordering parties/ potential counterparties they prefer to deal with, and those with which they wish to deal exclusively; the degree of trading transparency they require; and their wish or otherwise to manually authorise order matches before they are confirmed.

Potential counterparties can specify which ordering parties, or classes of ordering parties, they are prepared to offer credit to (and under what terms), and ones they are prepared to allow "ordering party-guarantors" to offer credit to and under what terms. Similarly, product ordering parties (uniquely) can specify: counterparty-guarantors with which they do and do not want to deal (individually and by type);

counterparties with which they wish to deal exclusively or preferentially to obtain a particular form of counterparty-credit; and potential "ordering party-guarantors" (external to INVENTCO) with which they do and do not want to deal.

Counterparty-guarantors can specify which potential counterparties have their authority to operate and which application promoters, product sponsors and ordering parties they are prepared, indirectly, to have relationships with. Similarly, regulators can specify which counterparty-guarantors, potential counterparties, ordering parties, application promoters, product sponsors and products have their authority to operate. Finally, consideration/entitlement transfer entities can monitor and maintain up-to-date rules with respect to ordering parties, counterparties, application promoters, product sponsors, counterparty-guarantors, and regulators they are and are not prepared to deal with—individually and by type.

Ordering Party Requirements

For their operation, CONTRACT APPS require primary product ordering party stakeholders to a CONTRACT APP, in registering an order for a product of their choice, to specify: the above-described "product type" and "other stakeholder involvement" information; multiple attributes of the specific order they are seeking; their interest or otherwise in being granted credit by potential counterparties for their contract consideration amount, or in availing themselves of the possible netting and collateralisation features of the APP concerned; the maximum (and possibly minimum) consideration "price" they are prepared to pay for their defined product; and various other dimensions of their needs, where these include: the name/title by which they wish to be identified by other APP stakeholders; the time at which they wish their order to be submitted; the period of time after an order has been submitted that they wish the order to be retained before it is automatically withdrawn; whether or not they are prepared to accept partial matches of their order; the degree of market transparency they wish to be exposed to; whether or not they wish to have the option of trading a matched contract on an authorised INVENTCO secondary market (See Process 5 description below); whether or not they wish to manually consider/authorise potential counterparty quotes on an order; in the case where potential counterparty quotes are required to be manually considered/authorised, the maximum time after potential counterparty quote details are provided to the ordering party that the ordering party wishes to consider the quote(s); and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received.

The above-mentioned multiple attributes of a specific primary order an ordering party is seeking include: their wish or otherwise to directly input the entitlement "coordinates" of their desired contingent claim order; their wish or otherwise to mathematically specify an entitlement function reflecting their desired product order, where such functions can be single or multidimensional (indicating a contingent contract entitlement conditional on two or more phenomena); the "consideration/entitlement unit", "currency" (if applicable), and "national currency" (if applicable) in which they wish to "pay"/"receive" their contract consideration/entitlement. Where an ordering party wishes to mathematically specify their desired primary product order as a single-dimensional entitlement function: the input term "X" can indicate the number of contract entitlement "inflection points" the ordering party is seeking within the allowable range of future product event values (including the value range extremity points); the input term "Alpha (X)" can indicate the ordering party-specified event value corresponding to the Xth future product event value contract entitlement inflection point; the input term "Beta (X)" can indicate the ordering party-specified desired entitlement amount (in the desired "consideration/entitlement form", "currency" and "national currency" entitlement denomination) corresponding to the Xth event value inflection point; and the input term "Gamma (X-1)" can indicate the ordering party-specified desired shape of the function between each of the co-ordinates: [Alpha (1), Beta (1)] and [Alpha (2), Beta (2)], [Alpha (2), Beta (2)] and [Alpha (3), Beta (3)], and so on (as applicable), where Gamma can represent all possible, mathematically definable, shapes.

Potential Counterparty Requirements

For their operation, CONTRACT APPS also require primary product "potential counterparty" stakeholders to a CONTRACT APP to define various parameters on the basis of which they can automatically price orders, including parameters with which they wish to establish a "consideration bid" on a defined product order; possible individual contract and product constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order; and possible expected-value product-portfolio constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order.

In defining parameters with which they wish to establish a "consideration bid" on a defined product order under a "EV-CE" pricing regime (described above), each potential counterparty is required to specify, amongst other things: an indicator of the appropriate "defined circumstances" of all possible product orders; a base "commission rate"; a base "discount rate"; (if applicable), a set of base "consideration/entitlement denomination", "currency" and "national currency" exchange rates; base "unit product prices"; and desired adjustments to the base commission rate, discount rate, exchange rates, and unit product prices on specific product orders according to the determined-value of the "defined circumstances" indicator (based on a specific product order).

Possible individual contract and product constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order, include: an absolute loss limit constraint (this constraint being specified as a single-figure constraint and/or as a function constraint); an expected loss limit constraint (this constraint defining the maximum "expected" aggregate loss the potential counterparty is prepared to incur on a contract/product, taking into account their assessment of the likelihood of all feasible future product values occurring); and a constraint on the maximum proportion of the expected total loss of the aggregate of the potential counterparty's contracts/products that can be accounted for by the expected loss of the defined individual contract/product. Similarly, possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order include the maximum (and possibly minimum) proportion of the expected total loss of the aggregate of the potential counterparty's product portfolio that can be accounted for by the expected loss of an individual contract/product.

Communications

CONTRACT APP stakeholders communicate with their applicable APP via AXSCO. Individual "stakeholder-to/from-AXSCO" communications can be by way of any/all of the following: voice communications with an AXSCO-linked "live operator" or "recorded messaging" system; touch-telephone communication with AXSCO directly; or computer-to-computer link with AXSCO (via a dedicated or dial-up communications line). With all three forms of communication, CONTRACT APP stakeholders may be required to utilize specified computer hardware and/or software mechanisms in their communications with AXSCO (including "payments" authorisation "black box" devices referred to below). Component Processes

In their manifestation as telecommunications/ computer software residing on telecommunications/ computer hardware, individual CONTRACT APPS consist of a cluster of processes, utilizing a number of data files, residing on one or more processing units. A cluster of nine (and potentially more or fewer) specific processes and their related data files reside within a CONTRACT APP: a process handling file administration and updating tasks supporting all other processes (termed Process 1); a process handling the receipt and processing of "primary" risk management contract transactions (termed Process 2); a process handling the receipt and processing of "secondary" risk management contract transactions (termed Process 3); a process handling the receipt and processing of "derivative-primary" risk management contract transactions (termed Process 4); a process handling the receipt and processing of "derivative-secondary" risk management contract transactions (termed Process 5); a process handling the "back office" management of all four types of risk management contract transactions (termed Process 6); a process handling non-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7); a process handling CONTRACT APP (and other INVENTCO) stakeholder access to specialist systems to assist these stakeholders decide how best to interface with the multiple aspects of INVENTCO (termed Process 8); and a process handling CONTRACT APP (and other INVENTCO) stakeholder access to a range of INVENTCO-facilitated "value added services" (termed Process 9). These processes may function concurrently.

Description of CONTRACT APP Processes

Process 1

Process 1 handles file administration and updating tasks supporting all other processes (FIG. 18). The PRODUCT, PRODUCT TRANS, DEAL LIST and DEAL LIST TRANS files referred to in FIG. 18 are applicable, individually or collectively, to primary, secondary, derivative-primary, and derivative-secondary contract orders. The SEL PRICE, SEL PRICE TRANS, SEL LIMIT and SEL LIMIT TRANS files are applicable only to primary and derivative-primary contract orders. The TRADE PRICE, TRADE PRICE TRANS, TRADE LIMIT and TRADE LIMIT TRANS files are applicable only to secondary and derivative-secondary contract orders.

The file administration and updating tasks handled by Process 1 comprise: dealing with general data-file information received from CONTRACT APP stakeholders; dealing with general data-file and order processing information received from relevant other INVENTCO stakeholders, particularity VIRPRO and AXSCO; dealing with trading support information received directly from CONTRACT APP stakeholders; dealing with potential counterparty primary, and derivative primary, product order "consideration bid" parameters and order-match constraints; dealing with existing-contract offering party secondary, and derivative secondary, order match conditions; and dealing with miscellaneous information from entities external to INVENTCO.

Existing and prospective stakeholders are required to supply their applicable CONTRACT APP with specified identification and other information, and to continually maintain the integrity of this information. For each stakeholder, this information includes: applicable name(s), addresses, contact numbers, and references; their desired system access medium; their consideration/entitlement transfer entity account details; and, if applicable, their required schedule of fees and charges payable by other INVENTCO stakeholders. This information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

VIRPRO is required to supply the applicable CONTRACT APP with various forms of general data-file information including: identification data relating to the application promoter for (each) CONTRACT APP; details of the permitted types of system access mediums; and consideration/entitlement denominations available in each application. Again, this information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

VIRPRO is similarly required to supply the applicable CONTRACT APP with various forms of general data-file information including: information on all data received by and sent from the various parts of INVENTCO to one another and to entities external to INVENTCO; and statistical information of various types, including data traffic volumes, data file location information and so on. This information is continuously collected by AXSCO and maintained in the data file HISTORY.

Trading support information received directly from CONTRACT APP stakeholders comprises stakeholder relationship information of a general nature, and specific information from individual stakeholders.

Stakeholder relationship information of a general nature comprises "transaction communication parameters" and automatic/manual deal and no deal flags". Transaction communication parameters are parameters set by all (registered) CONTRACT APP stakeholders defining the bounds within which they wish, for security reasons, all of their communications within INVENTCO to fall. Automatic/manual deal and no deal flags are "flags" set, as required, by all (registered) CONTRACT APP stakeholders indicating their requirements with respect to dealing with other CONTRACT APP stakeholders. This information is maintained in the data file DEAL LIST, updated information being received by way of the transaction file DEAL LIST TRANS.

Specific information from individual stakeholders differs according to the category of stakeholder involved.

Application promoters provide, amongst other things: information for the data file, PRODUCT (updated transactions being received from the file, PRODUCT TRANS), and further information for the data file ADMIN (updated transactions being received from the file, ADMIN TRANS). Information for the data file, PRODUCT includes details of the specific products application promoters offer for trading/exchange/transfer. Information for the data file, ADMIN includes: the order pricing and matching process upon which the application is based; the consideration/entitlement "value date" regime upon which their application is based; the categories of other stakeholders allowed to participate in the application and the conditions under which they can do this; the specific rules of engagement of counter-party-guarantors by potential counterparties; the availability and, in turn, the terms and conditions for CONTRACT APP stakeholder utilization of "consideration credit", "collateralisation", and "netting" features of the application (embodied in the various post-order-processing management routines); and details of the consideration/entitlement transfer entities involved in the application and relevant security information concerning account access.

Product sponsors provide full details of the product(s) they are sponsoring; product ordering parties and potential counterparties (collectively) indicate, with respect to each other, the parties they either prefer to deal with or wish to deal with exclusively. Potential counterparties (exclusively) provide a variety of specific information, including: details of the Application promoter, Product sponsor, and Counterparty-guarantor rules under which they have chosen to operate; data recording the lines of credit (if any) offered to ordering parties and the general and specific terms and conditions of these credit lines (applicable to ordering parties individually and/or to defined classes of ordering parties); parameters with which a potential counterparty wishes to determine its consideration "bids" on orders. Counterparty-guarantors provide details of the potential counterparties (if any) they have agreed to guarantee and the nature of such guarantees. Regulators provide details of: all entities having a stake in the application and their relationships to one another (for example, which counterparty-guarantors cover which counterparties, which potential counterparties offer which products, and so on); specific regulations developed for the regime; and parameters defining the taxation treatment of all types of orders and related transactions. Consideration/entitlement transfer entities provide "set-up" and on-going account access and balance-updating services. All of the above-described information is maintained in the data file, ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

In dealing with potential counterparty primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required, amongst other things, to: define various parameters with which they wish to establish a consideration bid on a defined product order; and define parameters with which the potential counterparty wishes to determine adjustments to the "base-price" bids on product orders according to the specific ordering party involved (this information is maintained in the data file SEL PRICE; updated information is received by way of the transaction files SEL PRICE TRANS); define possible individual contract and product constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order; and define possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order (these latter two categories of information are maintained in the data files SEL LIMIT and BUY LIMIT; updated information being received by way of the transaction file SEL LIMIT TRANS).

In dealing with existing-contract offering party secondary order match conditions, offering parties are required, amongst other things, to specify: the Order IDs of the contracts in which the entity concerned wishes to "sell" its position as a contract stakeholder, and, for each such contract, the pricing and other parameters it requires to be satisfied before a contract position "sale" is effected. This information is maintained in the data file TRADE PRICE; updated information is received by way of the transaction file TRADE PRICE TRANS.

In dealing with potential counterparty derivative-primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required to provide essentially the same information described above in relation to primary product orders. However, in addition, information directly applicable to the relevant type of derivative-primary transaction concerned (say, an option to establish a primary product order at a later date) is also required.

In dealing with existing-contract-offering party derivative-secondary order match conditions, offering parties are required to provide essentially the same information described above in relation to secondary product orders. However, in addition, information directly applicable to the relevant type of derivative-secondary transaction concerned (say, an option to sell a position in a primary product order at a later date) is also required.

In dealing with miscellaneous information from entities external to INVENTCO, this information can be of any type and may, potentially, be used by any part of INVENTCO; the information is maintained in the data-file ADMIN with updated information being received by way of the transaction file ADMIN TRANS.

Process 2

Process 2 handles the receipt and processing of "primary" risk management contract transactions, such transactions being of multiple types. Various sub-processes of Process 2 handle the receipt and processing of all possible types of these transactions, including product order processing, price quote requests, and withdrawals of existing product orders.

Primary "product orders" constitute the core "primary" risk management contract transaction type (FIG. 19 provides a summary flow chart, and the document text provides a detailed flow chart and description of the processing of this transaction type).

Primary product orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of a single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the term "Beta (X)", the term

"Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is prepared to "pay" for their defined product; miscellaneous other dimensions of the ordering party's needs, and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received). Upon its receipt, all of this information is written to—and subsequently processed from—the file PORD NEW.

Three sub-processes are involved in processing primary product orders—order authorisation, order matching, and matched order confirmation. In the case of the anticipated most typical form of order, termed a "normal-automatic" primary product order these sub-processes function as follows:

The primary product order authorisation sub-process verifies that all orders contain data appropriate to the product being sought and that each ordering party is accurately identified and credentialled (this sub-process draws principally on the data-file, PPRODUCT).

The primary product order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential-counterparties, individual potential-counterparty "pricing" calculations, and counterparty selection.

The "short-listing of potential counterparties" sub-process component establishes a list of potential counterparties (if any) willing to offer the product sought by the ordering party, upon their receipt from the ordering party of a consideration they deem to be appropriate (this sub-process draws principally on the data-file, PDEAL LIST).

The individual potential-counterparties pricing calculations sub-process component utilises the above-described pricing parameters pre-specified by each short-listed potential counterparty to calculate the "bid" each of them is prepared to make on the ordering-party's product order (or part thereof), and to add these to the potential counterparties short-list file (this sub-process draws principally on the data-file, PSEL PRICE).

The "counterparty selection" sub-process component extracts from the above-described "potential-counterparties short-list" file the best possible counterparty(ies) for the ordering party's transaction, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and the price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched order is deemed to be in existence (this sub-process draws principally on the data-file, PSEL LIMIT).

The matched order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the contract, including confirmation of the product ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required contract consideration (and possible other applicable fees). Automatic approvals of contracts are made by the CONTRACT APP electronically transferring resources recorded in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty (See Appendix H for a description of the consideration/ entitlement "payment" process). In turn, automatic updates of the counterparty's matching constraints maintained in the file PSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, PORD QUEUE, for subsequent match attempts; matched and confirmed order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the file PORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process drawing principally on the data-file, ADMIN), records of this being written to the file PORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 3

Process 3 handles the receipt and processing of "secondary" risk management contract transactions. Like "primary" risk management contracts, "secondary" risk management contracts are of multiple types; various sub-processes of Process 3 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

"Secondary product orders" constitute the core "secondary" risk management contract transaction type (FIG. 20 provides a summary flow chart of the processing of this transaction type).

"Secondary" product orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract; the potential acquiring party's interest or otherwise in being granted credit by offering parties for the yet-to-be-determined contract acquisition amount; the acquiring party's interest or otherwise in availing themselves of the possible netting and other features of the APP concerned; the acquisition "price" range within which the potential acquiring party is prepared to "pay" for the contract they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file SORD NEW.

Three sub-processes are involved in processing secondary product orders—order authorisation, order matching, and matched order confirmation. In the case of the anticipated most typical form of order, termed a "normal-automatic" secondary product order these sub-processes function as follows:

The secondary product order authorisation sub-process verifies that all orders contain data appropriate to the contract sought and that each potential acquiring party is accurately identified and credentialled (this sub-process draws principally on the data-file, SPRODUCT).

The secondary product order matching sub-process locates sought-after contract records and, based on the contents of these records, determines whether a "sale" of the position of the specified stakeholder in the contract to the potential acquiring party is possible—in particular, whether the acquisition "price" range within which the potential acquiring party has specified it is prepared to "pay" for the position of the specified current stakeholder is equal to, or in excess of, the "allowable sale price" figure prespecified by the applicable contract stakeholder. If a contract "sale" is found to be possible, and there being no requirements for manual-approval intervention by any relevant stakeholder, a "match" is deemed to have occurred.

The secondary product matched order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the contract position "sale", including confirmation of the contract acquiring party's ability to immediately pay (or be granted current stakeholder credit, or acquiring party guarantor credit, for) the required "sale price" consideration (and possible other applicable fees). Automatic approvals of such "sales" are made by the CONTRACT APP electronically transferring resources recorded in the acquiring party's applicable consideration/entitlement transfer entity account to the account of the applicable current contract stakeholder.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, SORD QUEUE, for subsequent match attempts; matched and confirmed order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN), required records being written to the file SORD CONF for further "back-office" processing as required; and rejected order transactions are similarly notified to the relevant CONTRACT APP stakeholders (again, this process drawing principally on the data-file, ADMIN), required records being written to the file SORD REJ for further "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 4

Process 4 handles the receipt and processing of "derivative-primary" risk management contract transactions. Like "primary" risk management contracts, "derivative-primary" risk management contracts are of multiple types; various sub-processes of Process 4 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and existing product order withdrawals.

"Product option orders" is one illustrative "derivative-primary" risk management contract transaction type (FIG. 21 provides a summary flow chart of the processing of this transaction type).

"Derivative-primary" product option orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of a single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the term "Beta (X)", the term "Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract option consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is prepared to "pay" for their defined product option; miscellaneous other dimensions of the ordering party's needs, and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received). Upon its receipt, all of this information is written to—and subsequently processed from—the file DPORD NEW.

Three sub-processes are involved in processing derivative-primary product orders order authorisation, order matching, and matched order confirmation. In the case of the most likely form of the above-mentioned illustrative option order, termed a "normal-automatic" derivative-primary product option order these sub-processes function as follows:

The primary product option order authorisation subprocess verifies that all orders contain data appropriate to the product option being sought and that each ordering party is accurately identified and credentialled (this sub-process draws principally on the data-file, DPPRODUCT).

The primary product option order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential option-counterparties, individual potential option-counterparty "pricing" calculations, and option-counterparty selection.

The "short-listing of potential option-counterparties" sub-process component establishes a list of potential option-counterparties (if any) willing to offer the product option sought by the ordering party, upon their receipt from the ordering party of an option consideration they deem to be appropriate (this sub-process draws principally on the data-file, DPDEAL LIST).

The "individual potential option-counterparties pricing calculations" sub-process component utilises the above-described pricing parameters prespecified by each short-listed potential option-counterparty to calculate the "bid" each of them is prepared to make on the ordering-party's product option order (or part thereof), and to add these to the potential option-counterparties short-list file (this sub-process draws principally on the data-file, DPSEL PRICE).

The "option-counterparty selection" sub-process component extracts from the above-described "potential option-counterparties short-list" file the best possible counterparty(ies) for the ordering party's transaction, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and the price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched option order is deemed to be in existence (this sub-process draws principally on the data-file, DPSEL LIMIT).

The matched option order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the options contract, including confirmation of the product-option-ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required option product consideration (and possible other applicable fees). Automatic approvals of contracts are made by the CONTRACT APP electronically transferring resources recorded in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty. In turn, automatic updates of the option-counterparty's matching constraints maintained in the file DPSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched option-order transactions are written to the file, DPORD QUEUE, for subsequent match attempts; matched and confirmed option-order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the reference file DP MSTR, and the file DPORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process drawing principally on the data-file, ADMIN), records of this being written to the file DPORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

If/when an option-holder wishes to exercise its option over a pre-established contract, it does so by appropriately notifying the CONTRACT APP which, in turn, retrieves the contract record from DPMSTR, effects the necessary additional consideration payments, and writes a new record to PORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 5

Process 5 handles the receipt and processing of "derivative-secondary" risk Management contract transactions. Like "secondary" risk management contracts, "derivative-secondary" risk management contracts are of multiple types; various sub-processes of Process 5 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

"Product option orders" is an illustrative "derivative-secondary" risk management contract transaction type (FIG. 22 provides a summary flow chart of the processing of this transaction type).

"Derivative-secondary" product option orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract (in relation to which an option is to be purchased or sold); the potential acquiring party's interest or otherwise in being granted credit by offering parties for the yet-to-be-determined option contract acquisition amount; the acquiring party's interest or otherwise in availing itself of the possible netting and other features of the APP concerned; the acquisition "price" range within which the potential acquiring party is prepared to "pay" for the contract option they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file DSORD NEW.

The subprocesses involved in the processing of derivative-secondary product option orders are essentially a combination of the processes described above in the case of secondary product orders (Process 3) and derivative-primary product option orders (Process 4). At the completion of the matching process, matched orders are written to the reference file DSMSTR and the file DSORD CONF for subsequent back office processing.

If/when an option holder wishes to exercise its option over a pre-established contract, it does so by appropriately notifying the CONTRACT APP which, in turn, retrieves the contract record from DSMSTR, effects the necessary additional consideration payments, and writes a new record to SORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 6

Process 6 handles the "back office" management of "matched/confirmed" primary, secondary, derivative-primary, and derivative-secondary risk management contract transactions and transactions handled by Processes 7-9. The process incorporates multiple sub-processes, collectively accessing multiple data files (FIG. 23): primary risk management contract back office processing; secondary risk management contract back office processing; derivative-primary risk management contract back office processing; derivative-secondary risk management contract back office processing; "Process 7" transactions back office processing; "Process 8" transactions back office processing; and "Process 9" transactions back office processing.

In relation to the back-office management of confirmed/matched primary risk management contracts—a number of sub-processes are involved, including: Receipt of the previous operating day's "matured-contract actual product event value" sub-process; "Start-of-day PAYACC management" sub-process; Contract maturity management sub-process; Confirmed contract processing sub-process; Information compilation and distribution sub-process; Information extraction from primary orders sub-process; Contract valuation sub-process; Contract collateralisation payments sub-process; System Access and usage fee determination and payments sub-process; Bilateral obligations netting sub-process; Multilateral obligations netting sub-process; Bilateral payments netting sub-process; Multilateral payments netting sub-process; and "end-of-day PAYACC management" sub-process.

Receipt of the previous operating day's "matured-contract actual product event value" details. This sub-process is flowcharted in FIG. 24; it involves the applicable CONTRACT APP receiving "matured-contract actual product event value" details from the relevant product sponsors (external to INVENTCO). The primary data-file, MAT PROD VALUES, is updated with this information. The support data-files, ADMIN, HISTORY, and INFO are similarly updated with applicable information.

"Start-of-day" PAYACC management. This subprocess is flowcharted in FIG. 25; it involves the applicable CONTRACT APP receiving consideration/entitlement "actual account" opening-balances from participating consideration/entitlement transfer entities (external to INVENTCO) (see Process 7 for details). The primary data-files, PAYACC SHADOW and PAYACC FINAL are updated with this information. The support data-files, HISTORY, INFO and ADMIN, are similarly updated with applicable information.

Contract maturity management. This subprocess is flowcharted in FIG. 26; it involves the applicable CONTRACT APP determining and giving effect to primary and related entitlement-transfers to/from applicable CONTRACT APP stakeholders, applicable other INVENTCO stakeholders, where such transfers are principally reflected in entries to the data-file, PAYACC SHADOW. CONTRACT APP determines and gives effect to these transfers, principally by drawing upon product/contract information maintained in the data files, INTREG, MAT PROD VALUES, COLLAT, CREDIT MGMT, BILAT OBLIG NET, and MULTILAT OBLIG NET. These data-files are appropriately updated in the process as are the support data-files, ADMIN, HISTORY, TAX/SUB, PAYACC SHADOW and INFO.

Confirmed contract processing. This sub-process, flowcharted in FIG. 27, operates continually throughout each operating day. Details of new matched/confirmed contracts are read from the file PORD CONF and are then time-stamped and written to the file INTREG as two records—one record pertaining to the contract ordering party and the other to the contract counterparty. The support data files INFO, ADMIN, and HISTORY are appropriately updated in the process.

Information compilation and distribution. This sub-process, flowcharted in FIG. 28, operates continually (beyond a defined operating day), drawing on the data-file INFO. As already described, INFO is updated continually as CONTRACT APP and other INVENTCO events occur, including pertinent AXSCO message information written in the first instance to HISTORY. All relevant INVENTCO stakeholders have access to preauthorised parts of INFO.

Information extraction from primary orders. This sub-process, flowcharted in FIG. 29, is effected after the completion of the defined operating day. Essentially, it involves the single task of processing the data-file, HISTORY, to yield pertinent information for the data-file INFO. One of the most important items of information drawn from HISTORY is (confidential) information on all of the prior day's potential counterparty consideration bid parameters, in particular the data items termed "assessed probabilities of occurrence". This information yields "market" information for the subsequent contract valuation sub-process.

Contract valuation. This sub-process, flowcharted in FIG. 30, draws principally upon the above-described "markets" information previously written to INFO. Pertinent data from this file is "applied against" all outstanding contracts maintained in INTREG, thereby yielding updated "future product value (FPV)", "expected value" and "distribution" value information for all contracts and, from this, revaluations of all future entitlement "expected values" and "distribution" values. All these revaluation figures are maintained in INTREG with applicable information also being written to INFO and HISTORY.

Contract collateralisation payments. This subprocess, flowcharted in FIG. 31, draws principally on the data-file INTREG. Following the contract valuation process, this collateralisation process involves relevant INTREG records being read and, depending (amongst other things) on the precalculated "present value" of the expected future entitlement associated with each relevant contract, a calculated portion of the present value of the expected future consideration amount is debited or credited to the PAYACC SHADOW file of the applicable collateralisation trustee entity, and the product ordering party and/or counterparty as is applicable.

Generally, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a negative contract value, and if this negative value exceeds the prior contract valuation figure, the applicable entity's trust account is credited with the funds difference, with the entity's own consideration/entitlement transfer entity account being debited correspondingly. If this negative value does not exceed the prior contract valuation figure, the applicable entity's trust account is debited with the funds difference, with the entity's own consideration/entitlement transfer entity account being credited correspondingly. On the other hand, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a positive contract value, the only collateralisation payment adjustment called for is one in which all funds (if any) in the applicable entity's trust account are transferred to the entity's own consideration/entitlement transfer entity account. In each of the above-described cases, a record of all entries effected is written to the data-file, COLLAT, and a subset of this information is written to the data-files HISTORY and INFO.

System Access and usage fee determination and payments. This subprocess, flowcharted in FIG. 32, deals with the determination and payment of system access and usage fees (as distinct from contract maturity date fee payments). The function draws principally on the data-files ADMIN, and HISTORY. Fee payment parameters are maintained in data-file ADMIN. These parameters are applied against the day's new records already written to HISTORY. Debits and credits for fees so determined are written to PAYACC SHADOW with summary information written to INFO and HISTORY.

Bilateral obligations netting. This subprocess, flowcharted in FIG. 33, effectively maintains an up-to-date matrix of the present values of expected future entitlement (and other) obligations between pairs of participating ordering parties and counterparties (as well as other participating CONTRACT APP and INVENTCO stakeholders), continually adjusted on the basis of required current consideration, entitlement and other payments/receipts as they occur. As required, the function updates the above-described matrix in two stages. First, with the most recent contract revaluation figures contained within INTREG. And second, with the end-of-day payment/receipt amounts contained within PAYACC SHADOW. Consideration/entitlement transfer entity transfers from/to applicable entities are determined (according to the application-promoter specified parameters for so doing) on the basis of whether or not any/all of the adjusted bilateral present value figures are in excess of their allowable limits. These entries are written to PAYACC SHADOW, with the data-files BILAT OBLIG NET, INTREG, HISTORY, and INFO being subsequently updated.

Multilateral obligations netting. This subprocess, flowcharted in FIG. 34, is essentially the same as the bilateral netting function except that a specified "clearing/trustee" entity is effectively interposed between all bilateral counterparties and, as such, netted obligations are only between the specified "clearing house/trustee" entity and each participating entity.

Bilateral payments netting. This subprocess, flowcharted in FIG. 35, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bilaterally netted payments/receipts based on records contained in the data-file, PAYACC SHADOW. Single netted payment/receipt figures are then rewritten to PAYACC SHADOW, with the data-files BILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

Multilateral payments netting. Like bilateral payments netting, this subprocess, flowcharted in FIG. 36, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bilaterally netted payments/receipts to/from the applicable "clearing house/trustee" entity based on records contained in the data-file, PAYACC SHADOW. Single netted payment/receipt figures (to/from the "clearing house/trustee" entity) are then rewritten to PAYACC SHADOW, with the data-files MULTILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

"End-of-day" PAYACC management. This subprocess, flowcharted in FIG. 37, involves a three-stage process. First, the preparation of inter-consideration/entitlement transfer entity "balancing" transactions. Second, the transfer of the final contents of the PAYACC SHADOW data-file to the data-file, PAYACC FINAL. And third, the electronic transmission of the contents of PAYACC FINAL to the applicable consideration/entitlement transfer entities (external to INVENTCO). In turn, the subsidiary data-files, ADMIN, HISTORY, and INFO are updated.

Process 7

Process 7 handles non-CONTRACT APP-related obligation transfers between applicable INVENTCO stakeholders, that is, the transfer of ownership title over "assets" registered by INVENTCO—typically matched/confirmed contracts (recorded as CONTRACT APP INTREG records) and consideration/entitlement transfer entity resources (recorded as PAYACC records). Both of the above-mentioned items have value to their holder. This process enables holders of these items to assign or lend any portion of their holdings to others at their will through initiating the appropriate transactions as NCAROT TRANS. The process accesses a relatively small number of data files (See FIG. 38). NCAROT TRANS received result in appropriate updates to the primary data-files, PAYACC SHADOW and INTREG. In turn, the subsidiary data files, HISTORY, ADMIN and INFO are updated.

Process 8

Process 8 (flowcharted in FIG. 39) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to specialist systems to assist them decide how best to interface with one or more aspects of INVENTCO. In the case of CONTRACT APP stakeholders, the most likely users of this process, one collection of such specialist systems are termed "decision support systems". The purpose of these systems is to guide a user-stakeholder as to how it should react to/deal with the continually changing circumstances within the CONTRACT APP with which they are dealing. Different clusters of systems are applicable for different CONTRACT APP stakeholders. These systems involve a hierarchy of potentially any number of value-added components.

An example of one such system, useful to primary product ordering parties, is a system which helps an ordering party determine which of its prespecified, but as yet un-matched, orders it should withdraw and which of its potential new product orders it should submit. This system is in the form of a "utility optimization" mechanism which seeks to identify the best possible composition of outstanding orders (and thus, which existing, unmatched orders should be withdrawn and which new orders should be submitted) based on two things. First, an objective function which seeks to minimize the difference between a weighted sum of actual and desired values of a series of attributes (involving single or multiple products, covering the ordering party's "real business exposure" to each product, the ordering party's portfolio of contracts which have been "matched" but are not yet confirmed, orders which have been submitted but not yet matched, and potential yet-to-be-submitted orders (collectively termed the "buyer's objective portfolio"), these attributes including, amongst other things: the "expected value" of the objective portfolio; the "standard deviation" of the objective portfolio; the "incremental cash outflow" attribute of the objective portfolio; the "maximum absolute loss" attribute of the objective portfolio; the "expected loss" attribute of the objective portfolio; the "implied minimum return on investment" of the objective portfolio; and the "implied expected return on investment" of the objective portfolio. And second, a series of constraints specifying, amongst other things: the required "minimum values" of each objective function attribute; and required minimum product-shares in the ordering party's overall product portfolio. The mathematical form of this "optimization" could take any of a number of alternative forms.

An optimization mechanism similar to the one described above can also aid potential counterparties in defining their pricing parameters for application against incoming product orders.

Effectively, systems of the above-described type are collectively maintained as a software "library" within the applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entities independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, SSA TRANS. These requests result in the appropriate records in the file SSA being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link to INVENTCO. Appropriate records of the utilization of SSA records are written to the data-files HISTORY, ADMIN and INFO.

Process 9

Process 9 (flowcharted in FIG. 40) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to a range of INVENTCO-facilitated value added services. These services can include: accounting, reconciliation, and information services; value added information reseller services; financial services of multiple types; and data processing and telecommunications services. Effectively, software relating to these services is maintained as a software "library" within the applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entities independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, VAS TRANS. These requests result in the appropriate records in the file VAS being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link with INVENTCO. Appropriate records of the utilization of VAS records are written to the data-files HISTORY, ADMIN and INFO.

Process 2 Variables and Data Files

Listed below is the file name and description therefor.

Order Data Fields

OID Unique identification assigned by CONTRACT APP to every new order submitted.

BID Ordering party identification.

BREF Ordering party's own reference for this order.

PID Order field specifying the required product.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from. Implied is the account consideration/entitlement, currency, national currency.

ACC ENTITL The ordering party account the contract entitlement is to be paid into. Implied is the account consideration/entitlement, currency, national currency.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining un-matched.

OPRICE Price calculated and selected for this order (this value will be the matching price).

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

DCID Defined circumstances identification.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements. Counterparty Short List Arrays

PRICEFUNC(SID) Pricing function: function type and associated parameters.

ELFUNC(SID) Expected loss determination function: function type and associated parameters.

EVFUNC(SID) Expected value determination function: function type and associated parameters.

CR(SID) Commission rate to be used for the current defined circumstances.

DR(SID) Discount rate to be used for the current defined circumstances.

PRICE(SID) Price calculated by each counterparty.

EL(SID) Expected loss calculated for the current order by each counterparty.

AL(SID) Absolute loss calculated for the current order by each counterparty.

EV(SID) Expected values determined for the current order by each counterparty.

MCC(SID) Maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC(SID) Maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1(SID) Order expected loss limit.

ELL2(SID) Expected loss limits set by the counterparty for the product.

ELL3(SID) Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4(SID) Expected loss limits set by the counterparty for same month maturity products.

ELL5(SID) Expected loss limits set by the counterparty for orders in all products.

CEL2(SID) Current accumulated expected losses for the product.

CEL3(SID) Current accumulated expected losses for equivalent maturity date products.

CEL4(SID) Current accumulated expected losses for same month maturity products.

CEL5(SID) Current accumulated expected losses for orders in all products.

ALL1(SID) Absolute loss limit function for each contract.

ALL2(SID) Absolute loss limit function set for the product.

CAL2(SID) Current absolute limit function accumulated for the product.

EVL1(SID) Expected value limit on each order.

C-C/EDXCHANG(SID) Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG(SID) Counterparty currency exchange rates which covert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG(SID) Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC ENTITL into the product's consideration denomination.

E-CXCHANG(SID) Counterparty currency exchange rates which covert the ordering party's currency of ACC ENTITL into the product's denominated currency.

E-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

Miscellaneous Variables

BPRICE Best price selected from the PRICE(SID) array.

SID The currently selected or viewed counterparty identification.

INDEX Index counter variable required for calculating order prices.

P1 Value calculated by a pricing function at an index point.

P2 Value calculated by a pay-off function at an index point.

Master Files

File Description/Contents

PORD NEW Holds details of all new orders submitted by ordering parties:

BID Ordering party identification.

BREF Ordering party's own reference for this order.

PID Order field specifying the required product.

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from.

ACC C/ED The ordering party account consideration/ entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

ACC ENTITL The ordering party account the contract entitlement is to be paid into.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining un-matched.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements.

PORD QUEUE This master file holds details of orders which have already been authorised, and have attempted to match once before. Fields as in ORD NEW plus some additional fields:

OID Unique identification assigned by P-CONTRACT to every new order submitted.

PMAT Product maturity date.

C/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

DCID Defined circumstances identification.

PORD REJ All rejected orders reside in this file. Fields as in ORD QUEUE plus some additional fields:

ERRCODE Error code indicating why the order was rejected.

PORD CONF When an order is matched and fully confirmed, full details are stored in this master file. Fields as in ORD QUEUE plus some additional fields:

OPRICE Price calculated and selected for this order. This value will be the matching price.

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

PPRODUCT This master file holds information (definition details) about each product known to the system:

PID Product identification.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (FMAX), and the step size (PSTEP)).

PDEAL LIST This file holds a list of the ordering party/product/counterparty tuples of allowable deals to occur. Thus by specifying an ordering party (BID) and product (PID), a list of counterparties who are prepared to enter into a deal with the ordering party/product combination, can be obtained:

BID Ordering party identification

PID Product identification

SID Counterparty identification

ANON All stakeholder identifications requiring anonymous confirmation.

MANUAL All stakeholder identifications requiring manual authorisation

PSEL DC This file allows counterparties to define identifications for sets of potential order parameters.

Any order data field can be used to define an order.

Each defined circumstance identification is then used to set unique pricing parameters:

DCID Defined circumstances identifications.

BID Ordering party identification

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering part account the consideration is to be paid from.

ACC ENTITL The ordering party account the contract entitlement is to be paid into.

DTID Deal type identification.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PSEL PRICE Contains all counterparty pricing parameters, including commission rates, discount rates and exchange rates:

SID Counterparty identification

PID Product identification

DCID Defined circumstances identification

PRICEFUNC Pricing function: function type and associated parameters.

CR Commission rate to be used for the current ordering party in the current product.

DR Discount rate to be used for the current ordering party in the current product.

C-C/EDXCHANG Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG Counterparty currency exchange rates which covert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NCXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC ENTITL into the product's consideration denomination.

E-CXCHANG Counterparty currency exchange rates which covert the ordering party's currency of ACC ENTITL into the product's denominated currency.

E-NCXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

PSEL LIMIT Holds all counterparty portfolio limits and current accumulated exposures in the various mathematical forms allowed by the system:

SID Counterparty identification

PID Product identification

DATE Product maturity date.

MCC Maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC Maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1 Order expected loss limit.

ELL2 Expected loss limits set by the counterparty for the product.

ELL3 Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4 Expected loss limits set by the counterparty for same month maturity products.

ELL5 Expected loss limits set by the counterparty for orders in all products.

CEL2 Current accumulated expected losses for the product.

CEL3 Current accumulated expected losses for equivalent maturity date products.

CEL4 Current accumulated expected losses for same month maturity products.

CEL5 Current accumulated expected losses for orders in all products.

ALL1 Absolute loss limit function for each contract.

ALL2 Absolute loss limit function set for the product.

CAL2 Current absolute limit function accumulated for the product.

EVL1 Expected value limit on each order.

PAYACC Payment accounts for all registered stakeholders (inc. balances and previous SHADOW transactions), are stored in this master file:

ID Stakeholder identification.

NO Account number.

ACC C/ED The ordering party account consideration/entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

BALANCE Available funds.

GID Stakeholder identification guaranteeing the account.

Risk management contracts is a term used to refer to one type of contractual obligation which can be, but does not need to be, traded/exchanged/transferred, and subsequently processed and settled, using an INVENTCO system. Risk management contracts consist of "primary" risk management contracts; "secondary" risk management contracts; "derivative-primary" risk management contracts; and "derivative-secondary" risk management contracts.

"Primary" risk management contracts can be "simple" and "complex" in nature ("simple" contracts being derivatives of "complex" contracts).

A "simple" primary risk management contract is a tradeable or untradeable contract conveying an obligation on an entity, upon that entity being granted a consideration by another entity (or accepting a pledge to be granted a consideration by the other entity), to make an entitlement to that other entity depending on the value of a defined phenomenon, determined at a defined time in the future.

A "complex" primary risk management contract is a tradeable or untradeable contract conveying an obligation on either or both of two entities, upon one entity [usually] being granted a consideration by the other entity (or accepting a pledge to be granted a consideration by the other entity), to make an entitlement to pay/receive an entitlement from one another, depending on the value of a defined phenomenon, determined at a defined time in the future. A "complex" contract may, in turn, be "basic" or "advanced" in nature: a "complex-basic" contract being one that does not involve ordering party and/or matched order counterparty "collateralisation payments" to a third-party trustee or clearing entity during the life of a contract; and a "complex-advanced" contract being one that does involve ordering party and/or matched order counterparty "collateralisation payments" to a third-party trustee or clearing entity during the life of a contract.

"Secondary" risk management contracts are pre-existing "primary" risk management contracts offered for trade (individually or as a portfolio) by a "risk-counterparty" stakeholder to the underlying contract.

"Derivative-primary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on specified, but yet-to-be-established, primary risk management contracts.

"Derivative-secondary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on pre-existing primary risk management contracts (which may have been traded since they were first established), including instruments based on: specified, but yet-to-be established, secondary risk management contracts; and the intended tertiary trading/exchange/transfer of specified, established, secondary risk management contracts.

What is claimed is:

1. A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution, and wherein at least one credit record and one debit record is maintained with an exchange institution, the method comprising:

(a) maintaining a shadow credit record and a shadow debit record for a party to be held independently by the supervisory institution from the exchange institution;

(b) for every transaction resulting in an exchange obligation, the supervisory institution electronically adjusting said shadow credit record and/or shadow debit record, allowing only those transactions that do not result in a value of said shadow debit record being less than a value of said shadow credit record; and

(c) at the end of a period of time, the supervisory institution providing an instruction to the exchange institution to credit and/or debit in accordance with said adjustments of said allowed transactions, wherein said instruction being an irrevocable, time invariant obligation placed on the exchange institution.

2. The method of claim 1, wherein said exchange obligation arises out of a transaction linked to a share price.

3. The method of claim 1, wherein said exchange obligation arises out of a transaction linked to a weather event.

4. The method of claim 1, wherein said exchange obligation arises out of a transaction linked to a market event.

5. The method of claim 1, wherein said exchange obligation involves the transfer of shares in financial or physical assets.

6. The method of claim 1, wherein said exchange obligation involves a wager.

7. The method of claim 1, wherein said exchange obligation involves the transfer of a commodity.

8. The method of claim 1, wherein said exchange obligation arises out of a transaction involving money for goods, services, promises, credits or warrants.

9. The method of claim 1, wherein said period of time is a part of a day.

10. The method of claim 1, wherein each said adjustment takes place in chronological order.

11. The method of claim 1, wherein said step of providing an instruction represents one or more credits and/or one or more debits netted throughout a period for each party in respect to transactions of that period of time.

12. The method of claim 1, wherein the exchange institution is a credit card company.

13. The method of claim 1, wherein the exchange institution is a debit card company.

14. The method of claim 1, wherein the exchange institution is a bank.

15. The method of claim 1, wherein the exchange institution is a central bank.

16. The method of claim 1, wherein the exchange institution is a guarantor offering credit to one or more parties involved in said exchange obligation.

17. The method of claim 1, wherein the exchange institution is a party offering credit to one or more other parties involved in said exchange obligation.

18. The method of claim 1, wherein said exchange obligation arises out of a currency exchange transaction.

19. The method of claim 1, wherein two or more exchange institutions operate in different time zones.

20. The method of claim 1, wherein two or more exchange institutions have different account processing cycles.

21. The method of claim 1, wherein the transaction arises out of a collateralization payment obligation.

22. The method of claim 1, further comprising the step of obtaining from the exchange institution a balance for said shadow credit record and/or said shadow debit record.

23. The method of claim 1, wherein the exchange institution is a non-bank clearing house or depository.

24. The method of claim 1, wherein at least one credit record and one debit record is maintained with another exchange institution, the method further comprising administering an exchange obligation involving said another exchange institution in accordance with steps (a)-(c).

25. The method of claim 24, wherein said another exchange institution operates in a different time zone than the exchange institution.

26. The method of claim 24, wherein said another exchange institution has a different account processing cycle than the exchange institution.

27. A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution, and wherein an account is maintained with an exchange institution, the method comprising:

(a) maintaining a shadow record for a first party to be held independently by the supervisory institution from the exchange institution;

(b) for every transaction resulting in an exchange obligation, the supervisory institution electronically adjusting said shadow record, allowing only those transactions that do not result in a value of said shadow record being less than zero; and

(c) exchanging at least one transaction between the supervisory institution and the exchange institution at the end of a period of time in accordance with said adjustments made in step (b), wherein said transaction being an irrevocable, time invariant obligation placed on the exchange institution.

28. The method of claim 27, wherein the account pertains to shares in financial or physical assets.

29. The method of claim 27, wherein the account pertains to participation rights in wagers.

30. The method of claim 27, wherein the account pertains to goods.

31. The method of claim 27, wherein the account pertains to services.

32. The method of claim 27, wherein the account pertains to central bank exchange settlement account deposits.

33. The method of claim 27, wherein the account pertains to financial instrument deposits.

34. The method of claim 27, wherein the account pertains to credit extended to/from a party or to/from a guarantor of a party.

35. The method of claim 27, wherein the account includes an overdraft or line-of-credit with an exchange institution.

36. The method of claim 27, wherein said first party holds one or more accounts with more than one exchange institution.

37. The method of claim 27, wherein the supervisory institution and exchange institution are legally and/or geographically domiciled in different countries.

38. The method of claim 27, wherein one party is a buyer and the other party is a seller.

39. The method of claim 27, further comprising debiting and/or crediting said shadow record based on said transaction.

40. The method of claim 27, wherein said exchange obligation arises out of a collateralization payment obligation.

41. The method of claim 27, wherein said transaction involves a weather event.

42. The method of claim 27, wherein said transaction involves a market event.

43. The method of claim 27, wherein said transaction involves a wager.

44. The method of claim 27, wherein said transaction involves an exchange of money for goods, services, promises, credits or warrants.

45. The method of claim 27, wherein the exchange institution is a credit card company.

46. The method of claim 27, wherein the exchange institution is a debit card company.

47. The method of claim 27, wherein the exchange institution is a party offering credit to one or more other parties involved in said exchange obligation.

48. The method of claim 27, further comprising the step of obtaining from the exchange institution a balance for said shadow record.

49. The method of claim 27, wherein a second party maintains an account with an exchange institution that is different from the exchange institution that maintains the account for said first party.

50. The method of claim 49, wherein two or more exchange institutions operate in different time zones.

51. The method of claim 49, wherein two or more exchange institutions have different account processing cycles.

52. The method of claim 27, wherein exchanging said at least one transaction between the supervisory and the exchange institution at the end of a period of time represents netted adjustments made in step (b).

53. The method of claim 27, wherein said period of time is a part of a day.

54. The method of claim 27, wherein said exchange obligation arises out of a currency exchange transaction.

55. The method of claim 27, wherein the exchange institution is a bank.

56. The method of claim 27, wherein the exchange institution is a central bank.

57. The method of claim 27, wherein two or more exchange institutions have different account processing cycles.

58. The method of claim 27, wherein an account is maintained with another exchange institution, the method further comprising administering an exchange obligation involving said another exchange institution in accordance with steps (a)-(c).

59. The method of claim 58, wherein said another exchange institution operates in a different time zone than the exchange institution.

60. The method of claim 58, wherein said another exchange institution has a different account processing cycle than the exchange institution.

61. A method of exchanging a payment obligation of a currency exchange transaction between banks, wherein an exchange obligation is administered by a supervisory institution, and wherein at least one bank maintains a credit record and a debit record with a central bank, the method comprising:

(a) maintaining a shadow credit record and a shadow debit record for a bank to be held independently by the supervisory institution from the central bank;

(b) for every currency exchange transaction resulting in a payment obligation, the supervisory institution electronically adjusting said shadow credit record and/or shadow debit record, allowing only those currency exchange transactions that result in a net positive shadow record balance; and

(c) periodically providing an instruction to the central bank to credit and/or debit in accordance with said adjustment of said allowed currency exchange transaction, wherein said instruction being an irrevocable, time invariant obligation placed on the central bank.

62. The method of claim 61, wherein each said adjustment takes place in chronological order.

63. The method of claim 61, further comprising the step of obtaining from the central bank a balance for said shadow credit record and/or said shadow debit record.

64. The method of claim 61, wherein the step of periodically providing said instruction occurs at an end of a processing cycle.

65. A method of exchanging a payment obligation between a buyer and a seller, wherein the exchange of the payment obligation is administered by a supervisory institution, and wherein the buyer and seller maintain an account with a bank, the method comprising:

(a) maintaining a shadow record for the buyer or the seller to be held independently by the supervisory institution from the bank;

(b) for every transaction resulting in a payment obligation, the supervisory institution electronically adjusting said shadow record, allowing only those payment transactions that do not result in a value of said shadow record being less than zero; and

(c) exchanging at least one account transaction between the supervisory institution and the bank at the end of a period of time in accordance with said adjustments made in step (b), wherein said account transaction being an irrevocable, time invariant obligation placed on the bank.

66. The method of claim 65, further comprising the step of obtaining from the bank a balance for said shadow record.

67. The method of claim 65, wherein said period of time is a part of a day.

68. A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution, the method performed by the supervisory institution, comprising:

maintaining a first account for a first party, independent from a second account maintained by a first exchange institution;

maintaining a third account for a second party, independent from a fourth account maintained by a second exchange institution;

electronically adjusting said first account and said third account in order to effect the exchange obligation between said first party and said second party after ensuring that said first party and said second party have adequate value in said first account and said third account, respectively; and

providing an instruction to said first exchange institution and said second exchange institution to adjust said second account and said fourth account in accordance with the adjustment of said first account and said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and said second exchange institution.

69. The method of claim 68, wherein said first and/or second exchange institution is a central bank.

70. The method of claim 69, wherein said first exchange institution and said second exchange institution are the same.

71. The method of claim 68, wherein said second account and said fourth account are the same account.

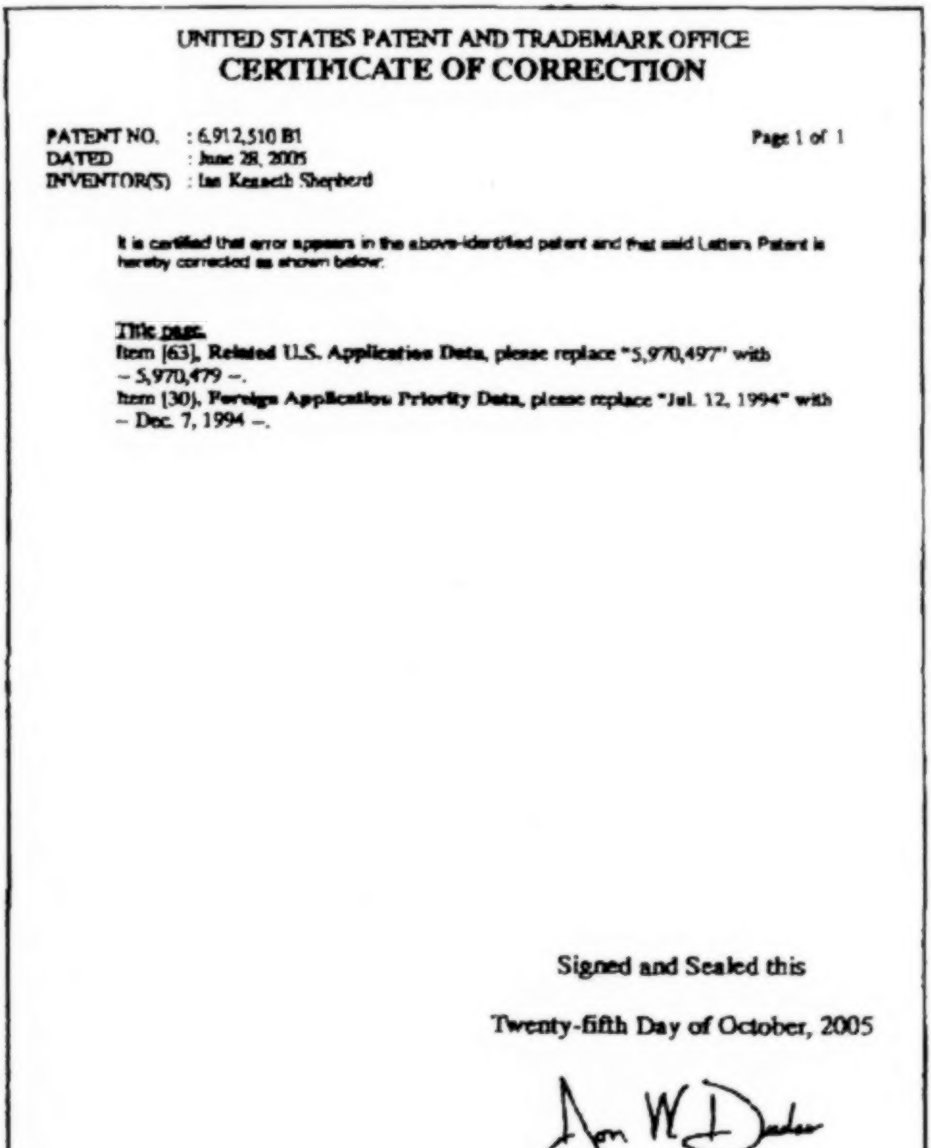
72. The method of claim 68, wherein the exchange obligation involves currency.

73. The method of claim 68, wherein said first and/or second exchange institution is a non-bank clearing house or depository.

74. The method of claim 68, wherein adequate value requires that said first account and said third account have a positive balance.

75. The method of claim 68, wherein said instruction to said first exchange institution and said second exchange institution represents adjustments to said first and said third account netted throughout a period of time.

* * * * *



UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,912,510 B1 Page 1 of 1
DATED : June 28, 2005
INVENTOR(S) : Ian Kenneth Shepherd

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page,
Item [63], **Related U.S. Application Data**, please replace "5,970,497" with
-- 5,970,479 --.
Item [30], **Foreign Application Priority Data**, please replace "Jul. 12, 1994" with
-- Dec. 7, 1994 --.

Signed and Sealed this

Twenty-fifth Day of October, 2005

Jon W Dudas

JON W. DUDAS
Director of the United States Patent and Trademark Office

EXHIBIT 3

United States Patent

Shepherd

[10] Patent No.: US 7,149,720 B2

[45] Date of Patent: *Dec. 12, 2006

SYSTEMS FOR EXCHANGING AN OBLIGATION

[75] Inventor: Ian K. Shepherd, Victoria (AU)

[73] Assignee: Alice Corporation Pty Ltd (AU)

[*] Notice: Subject to any disclaimer. the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 710 days.

This patent is subject to a terminal disclaimer.

[21] Appl. No.: 10/331,331

[22] Filed: Dec. 31, 2002

[65] Prior Publication Data

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Related U.S. Application Data

[63] Continuation of application No. 09/567,507, filed on May 9, 2000, now Pat. No. 6,912,510, which is a continuation of application No. 08/870,691, filed on Jun. 6, 1997, now Pat No. 6,134,536, which is a continuation-in-part of application No. 08/070,136, and a continuation-in-part of application No. PCT/ AU95/00827, filed on Dec. 7, 1995, now Pat. No. 5,970,479.

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[51] Int. Cl.
G06(2 40/00 (2006.01)

[52] U.S. Cl. 705/37; 705/80

[58] Field of Classification Search... 705/37, 705/4, 80
See application file for complete search history.

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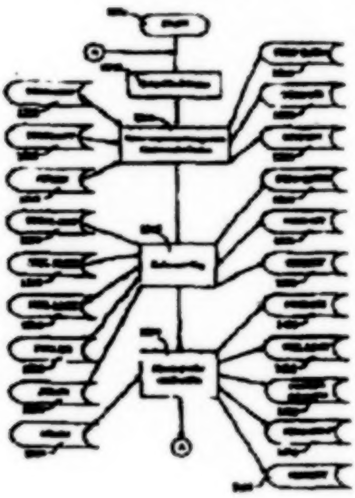
(57) ABSTRACT

A system for exchanging an obligation between parties where the exchange is administered by a supervisory institution that ensures real-time settling of obligations between parties by updating shadow records in real-time and instructing one or more exchange institutions to effect, from time to time, the exchange of obligations in accounts maintained external to the supervisory institution. Updates to the exchange institution accounts may reflect the net obligations of parties over a nominated period of time. The role of the supervisory institution is to ensure that obligations are only settled where parties have sufficient balance in their shadow records to complete the transaction. Obligations that can be exchanged include, but are not limited to: shares in financial or physical assets, participation rights in wagers, national or synthetic currencies, exchange settlement accounts deposits, taxation account deposits, and deposit of financial instruments or precious metals.

84 Claims, 117 Drawing Sheets



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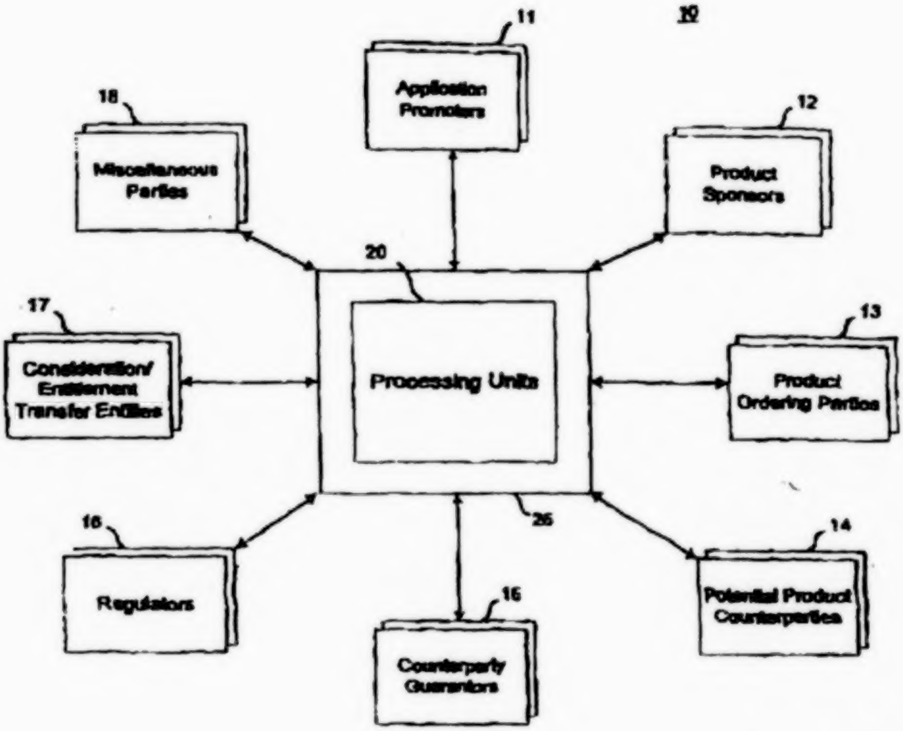

10
11
Application Promoters
18
Miscellaneous Parties
12
Product Sponsors
20
17
Consideration/ Entitlement Transfer Entities
Processing Units
13
Product Ordering Parties
16
Regulators
25
14
Potential Product Counterparties
15
Counterparty Guarantors

FIG. 1

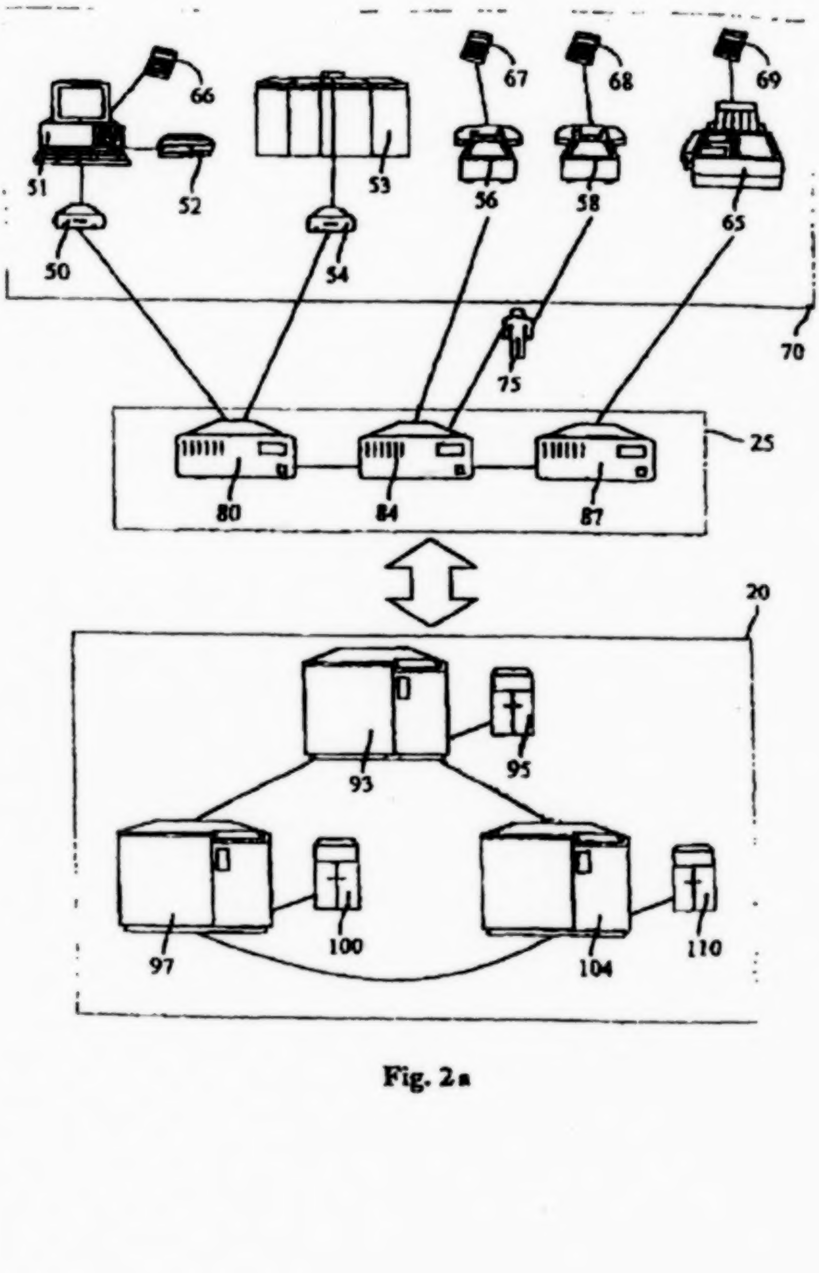


Fig. 2a

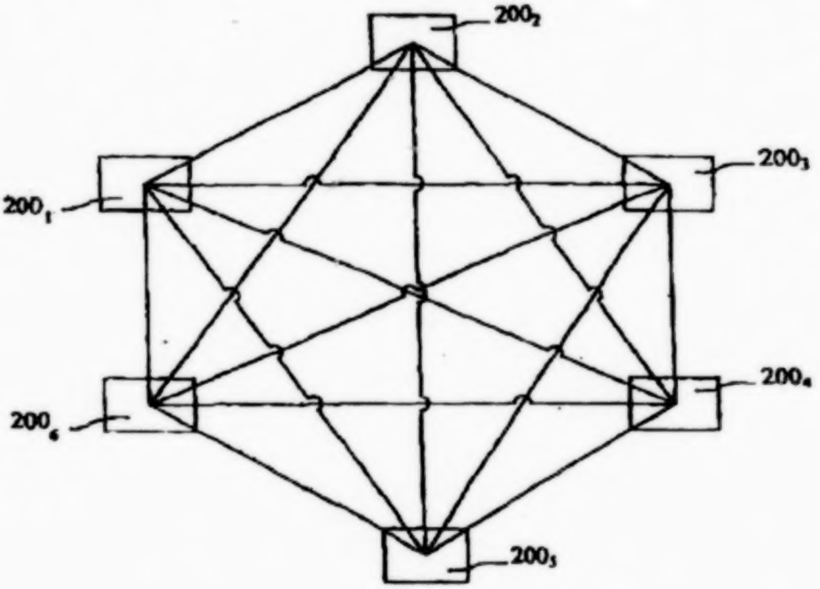

200_2
200_3
200_1
200_4
200_6
200_5

Fig. 2b

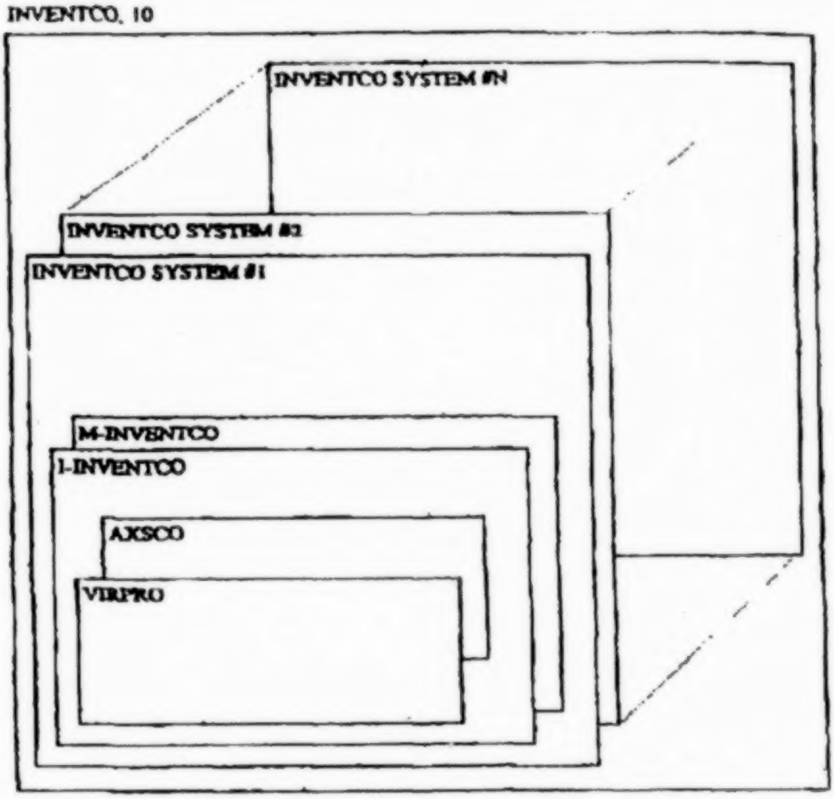

INVENTCO, 10
INVENTCO SYSTEM #N
INVENTCO SYSTEM #2
INVENTCO SYSTEM #1
M-INVENTCO
1-INVENTCO
AXSCO
VIRPRO

Fig. 3

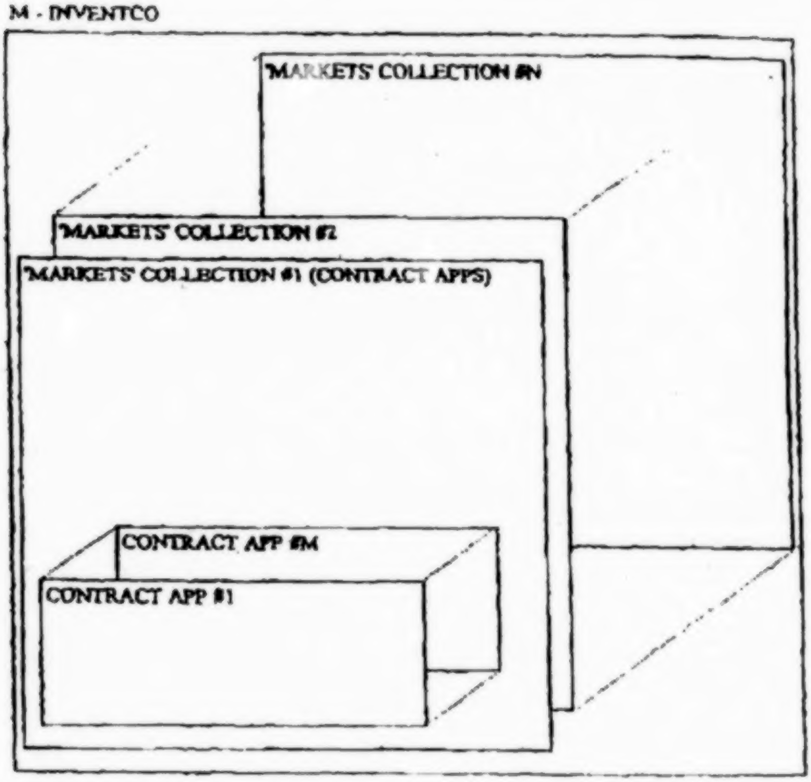

M - INVENTCO
'MARKETS' COLLECTION #N
'MARKETS' COLLECTION #2
'MARKETS' COLLECTION #1 (CONTRACT APPS)
CONTRACT APP #M
CONTRACT APP #1

Fig. 4

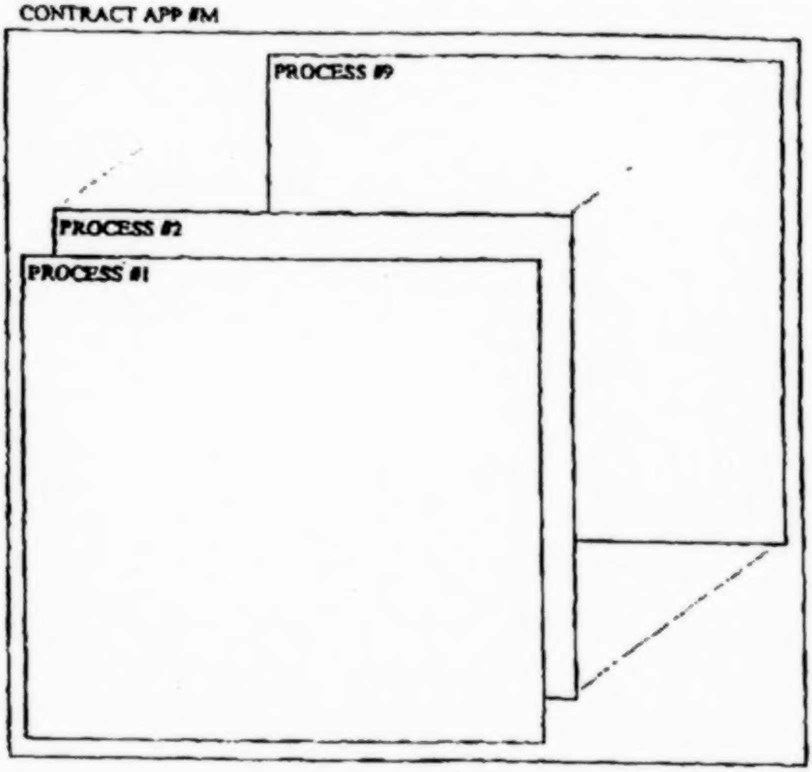

CONTRACT APP #M
PROCESS #9
PROCESS #2
PROCESS #1

Fig. 5

EXAMPLE I

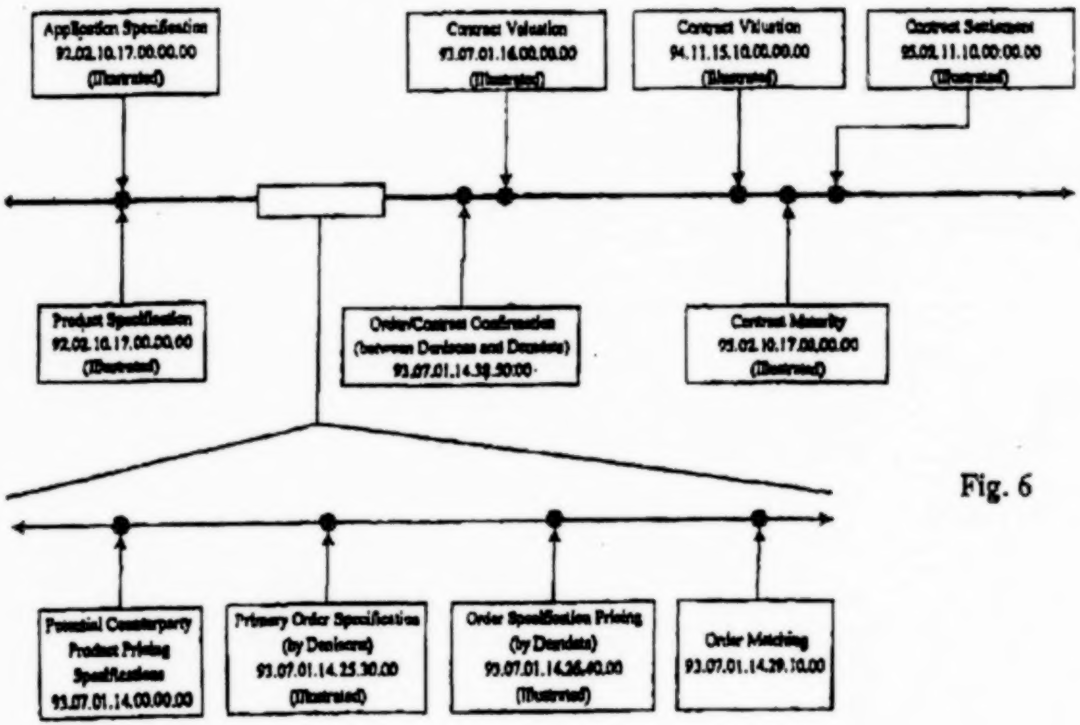

Application Specification
92.02.10.17.00.00.00
(Illustrated)
Contract Valuation
93.07.01.16.00.00.00
(Illustrated)
Contract Valuation
94.11.15.10.00.00.00
(Illustrated)
Contract Settlement
95.02.11.10.00:00.00
(Illustrated)
Product Specification
92.02.10.17.00.00.00
(Illustrated)
Order/Contract Confirmation
(between Denizens and Denizens)
93.07.01.14.38.50.00
Contract Maturity
95.02.10.17.00.00.00
(Illustrated)
Potential Counterparty
Product Pricing
Specifications
93.07.01.14.00.00.00
Primary Order Specification
(by Denizens)
93.07.01.14.25.30.00
(Illustrated)
Order Specification Pricing
(by Denizens)
93.07.01.14.26.40.00
(Illustrated)
Order Matching
93.07.01.14.29.10.00

Fig. 6

EXAMPLE II

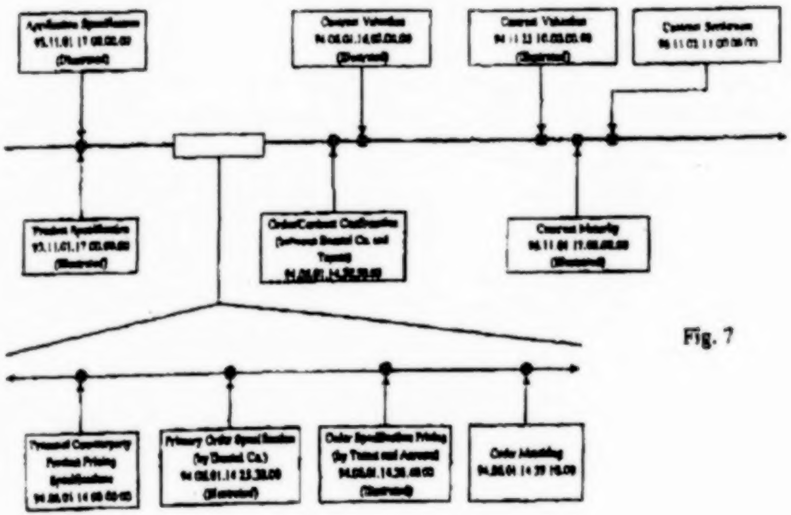

Application Specification
Product Specification
Coupon Valuation
Order/Contract Clarification
Current Valuation
Current Monthly
Contract Settlement
Primary Order Specification
(by Dental Co.)
Order Specification Pricing
Order Matching

Fig. 7

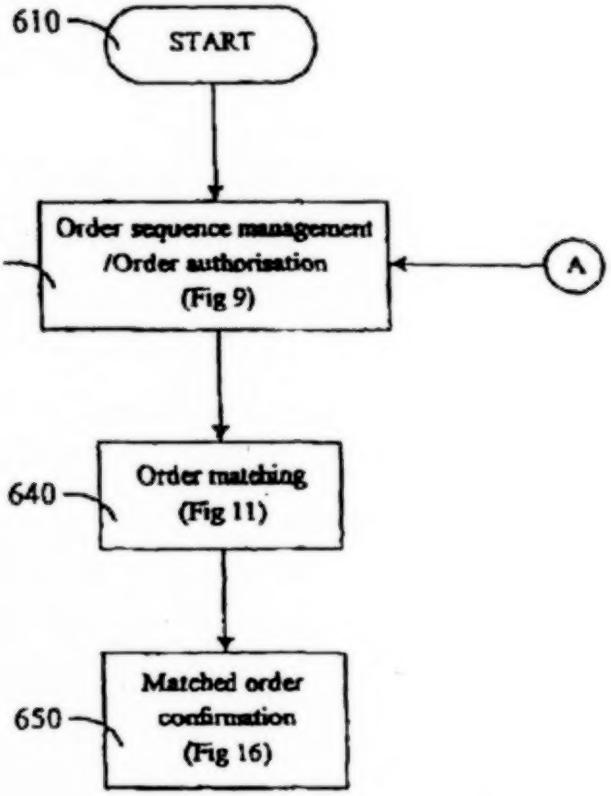

610
START
625
Order sequence management
/Order authorisation
(Fig 9)
A
640
Order matching
(Fig 11)
650
Matched order
confirmation
(Fig 16)

Fig. 8

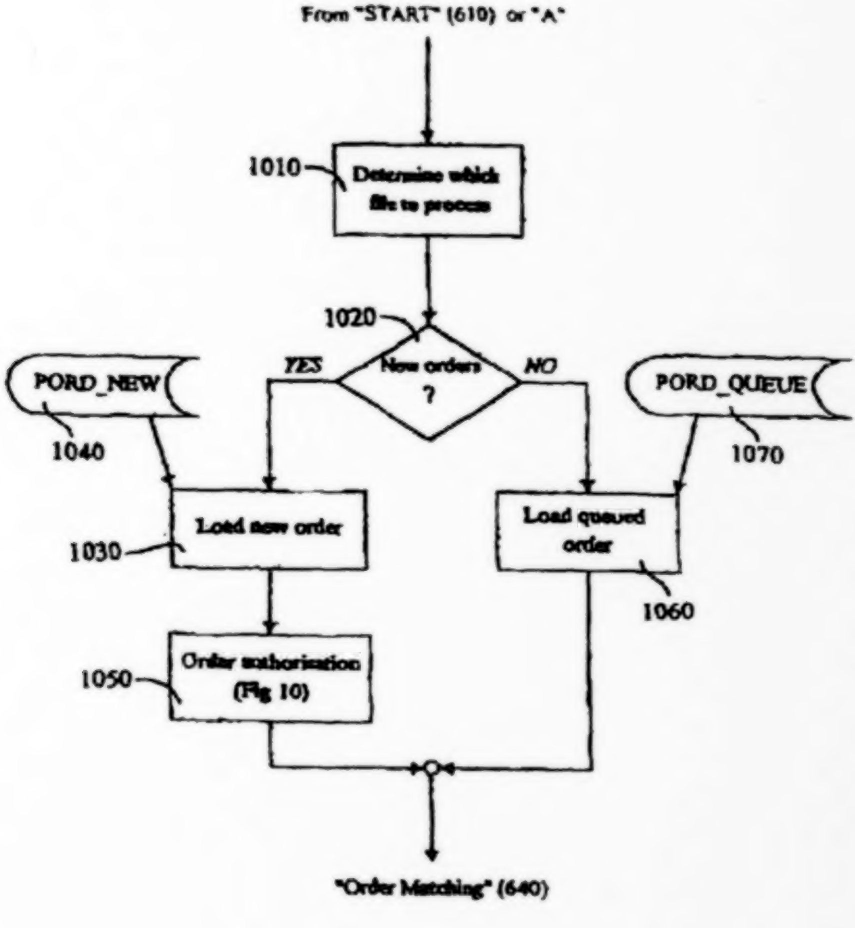

From "START" (610) or "A"
1010
Determine which file to process
1020
New orders ?
YES
NO
PORD_NEW
1040
PORD_QUEUE
1070
Load new order
1030
Load queued order
1060
Order authorisation (Fig 10)
1050
"Order Matching" (640)

Fig. 9

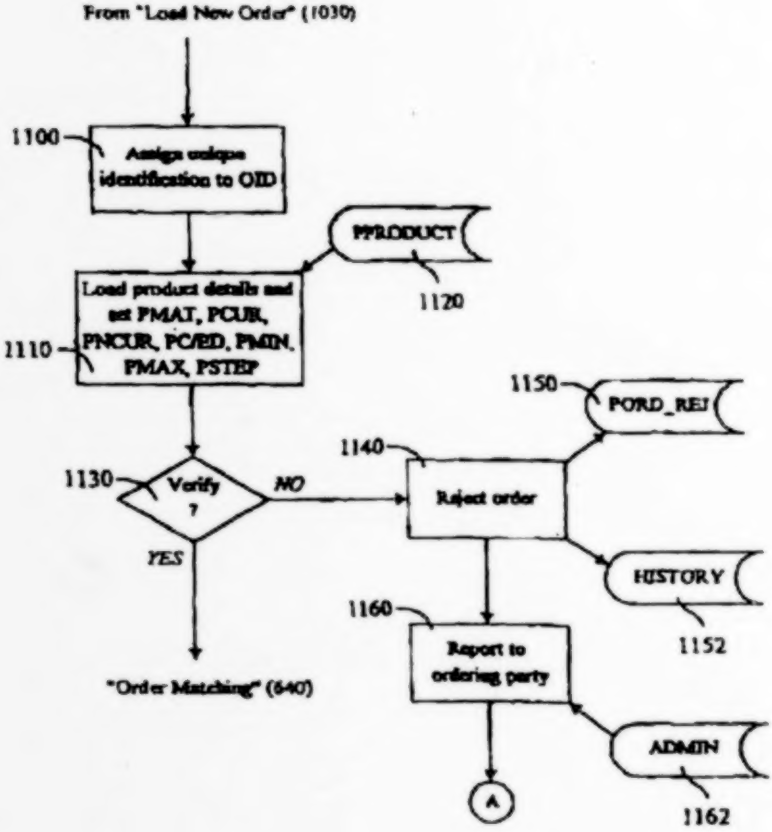

From "Load New Order" (1030)
1100
Assign unique identification to OID
PPRODUCT
1120
Load product details and set PMAT, PCUR, PNCUR, PC/ED, PMIN, PMAX, PSTEP
1110
1150
PORD_REJ
1140
1130
Verify ?
NO
Reject order
YES
HISTORY
1152
1160
Report to ordering party
"Order Matching" (640)
ADMIN
A
1162

Fig. 10

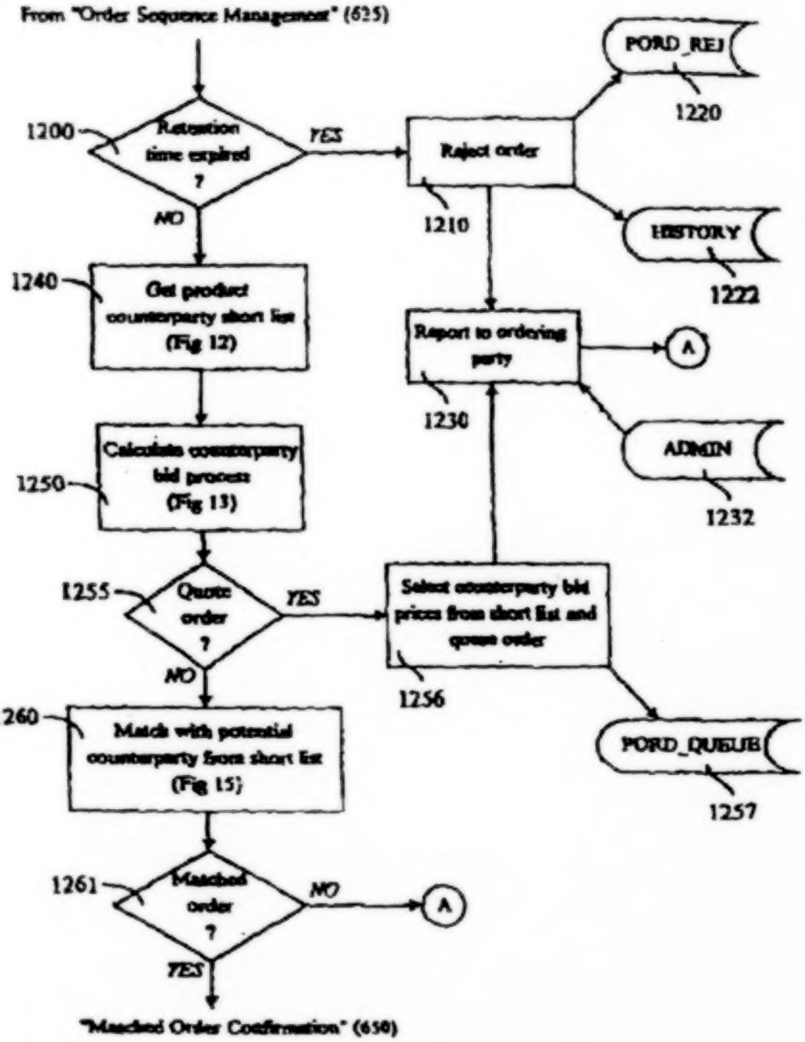

From "Order Sequence Management" (625)
1200
Retention time expired ?
YES
NO
Reject order
1210
PORD_REJ
1220
HISTORY
1222
1240
Get product counterparty short list (Fig 12)
Report to ordering party
1230
A
ADMIN
1232
1250
Calculate counterparty bid process (Fig 13)
1255
Quote order ?
YES
NO
Select counterparty bid prices from short list and queue order
1256
PORD_QUEUE
1257
1260
Match with potential counterparty from short list (Fig 15)
1261
Matched order ?
NO
A
YES
"Matched Order Confirmation" (650)

Fig. 11

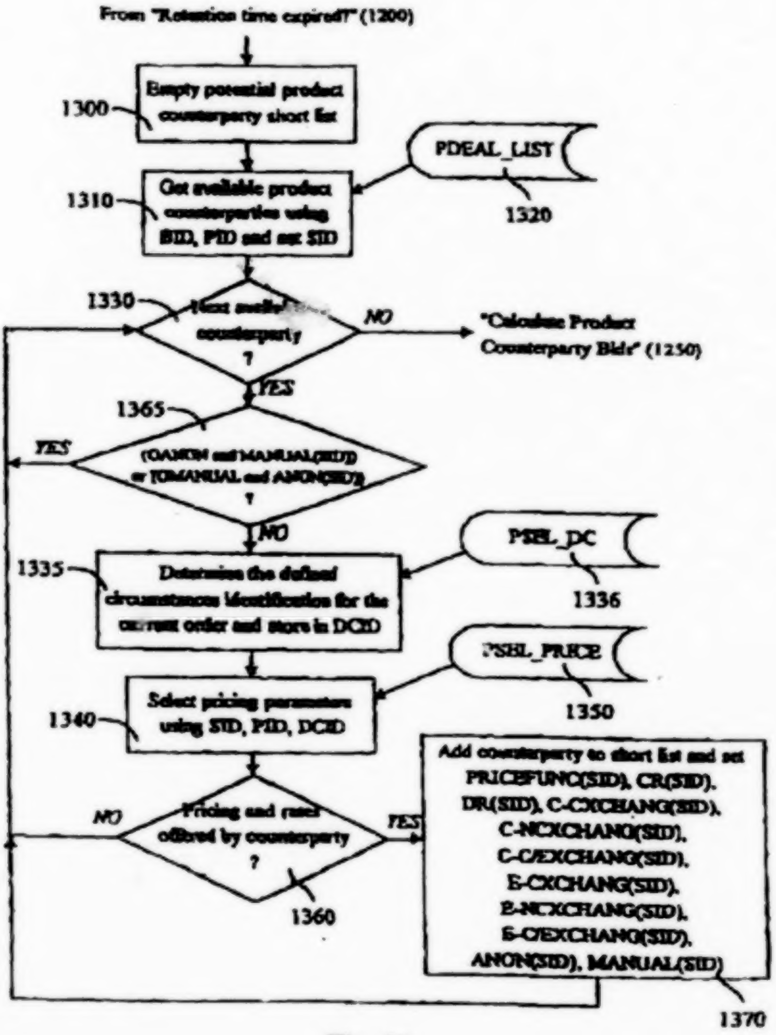

From "Retention time expired?" (1200)
Empty potential product counterparty short list
1300
Get available product counterparties using BID, PID and set SID
1310
PDEAL_LIST
1320
Next available counterparty ?
1330
NO
"Calculate Product Counterparty Bids" (1250)
YES
1365
(!ANON and MANUAL(SID)) or (!MANUAL and ANON(SID))
?
YES
NO
Determine the defined circumstances identification for the current order and store in DCID
1335
PSHL_DC
1336
PSHL_PRICE
1350
Select pricing parameters using SID, PID, DCID
1340
Pricing and rates offered by counterparty ?
1360
NO
YES
Add counterparty to short list and set PRICEFUNC(SID), CR(SID), DR(SID), C-CXCHANG(SID), C-NCXCHANG(SID), C-C/EXCHANG(SID), E-CXCHANG(SID), E-NCXCHANG(SID), E-C/EXCHANG(SID), ANON(SID), MANUAL(SID)
1370

Fig. 12

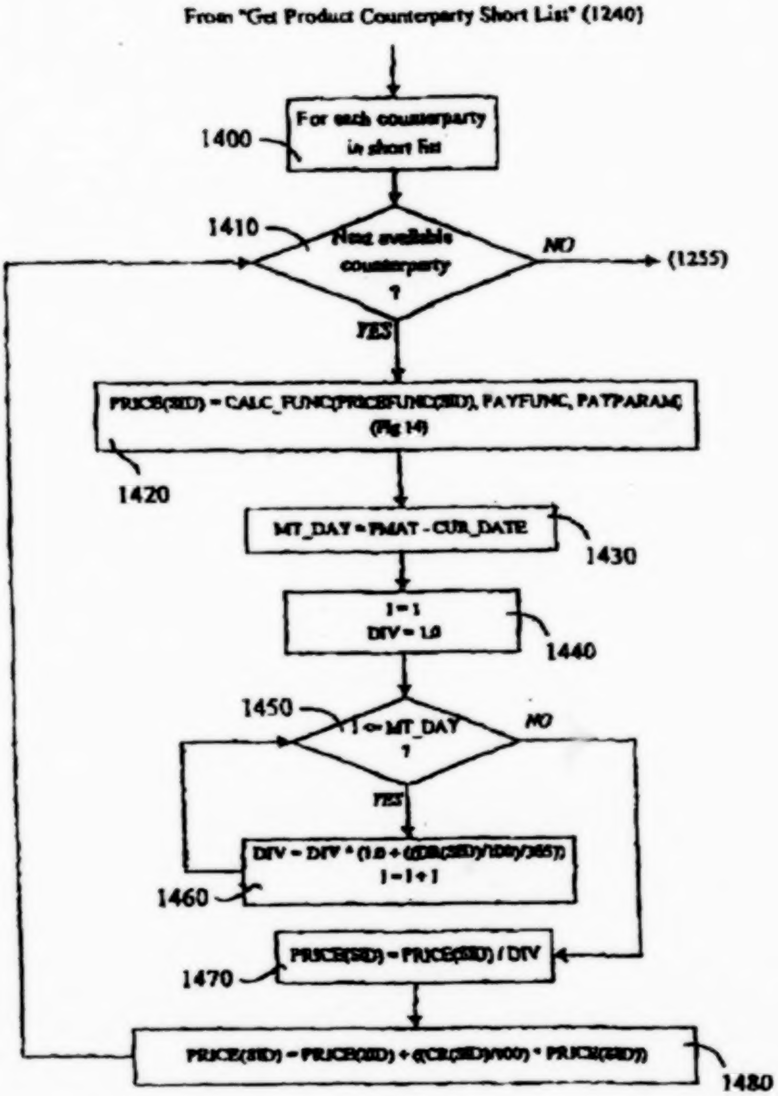

From "Get Product Counterparty Short List" (1240)
1400
For each counterparty in short list
1410
Next available counterparty ?
NO
(1255)
YES
PRICE(SID) = CALC_FUNC(PRICEFUNC(SID), PAYFUNC, PAYPARAM)
(Fig 14)
1420
MT_DAY = PMAT - CUR_DATE
1430
I = 1
DIV = 1.0
1440
1450
I <= MT_DAY ?
NO
YES
DIV = DIV * (1.0 + ((DR(SID)/100)/365))
I = I + 1
1460
PRICE(SID) = PRICE(SID) / DIV
1470
PRICE(SID) = PRICE(SID) + ((CR(SID)/100) * PRICE(SID))
1480

Fig. 13

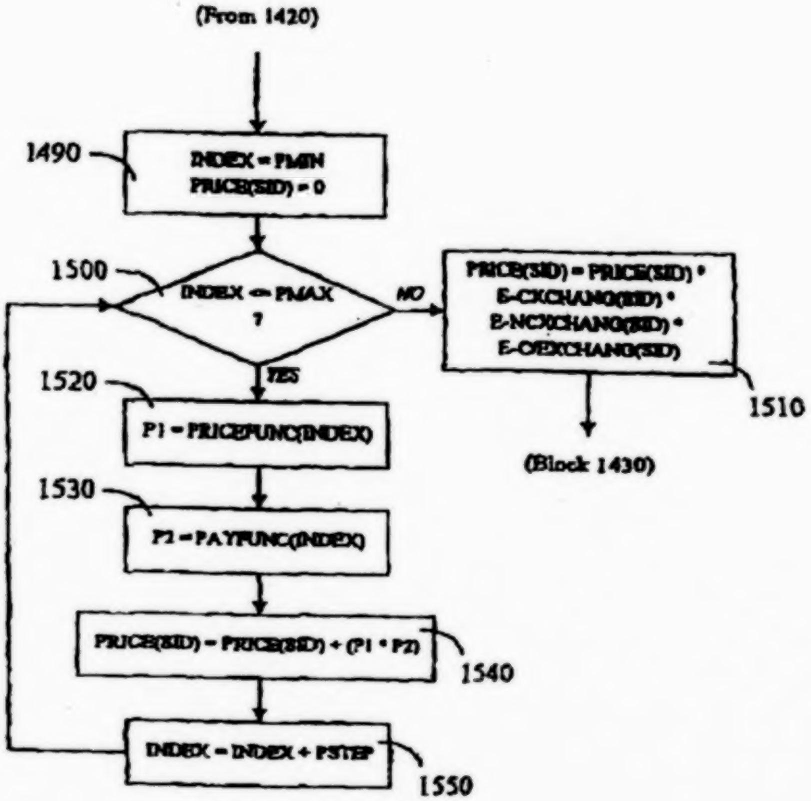

(From 1420)
1490
INDEX = PMIN
PRICE(SID) = 0
1500
INDEX <= PMAX
?
NO
YES
PRICE(SID) = PRICE(SID) *
E-CXCHANG(SID) *
E-NCXCHANG(SID) *
E-OEXCHANG(SID)
1510
(Block 1430)
1520
P1 = PRICEFUNC(INDEX)
1530
P2 = PAYFUNC(INDEX)
PRICE(SID) = PRICE(SID) + (P1 * P2)
1540
INDEX = INDEX + PSTEP
1550

Fig. 14

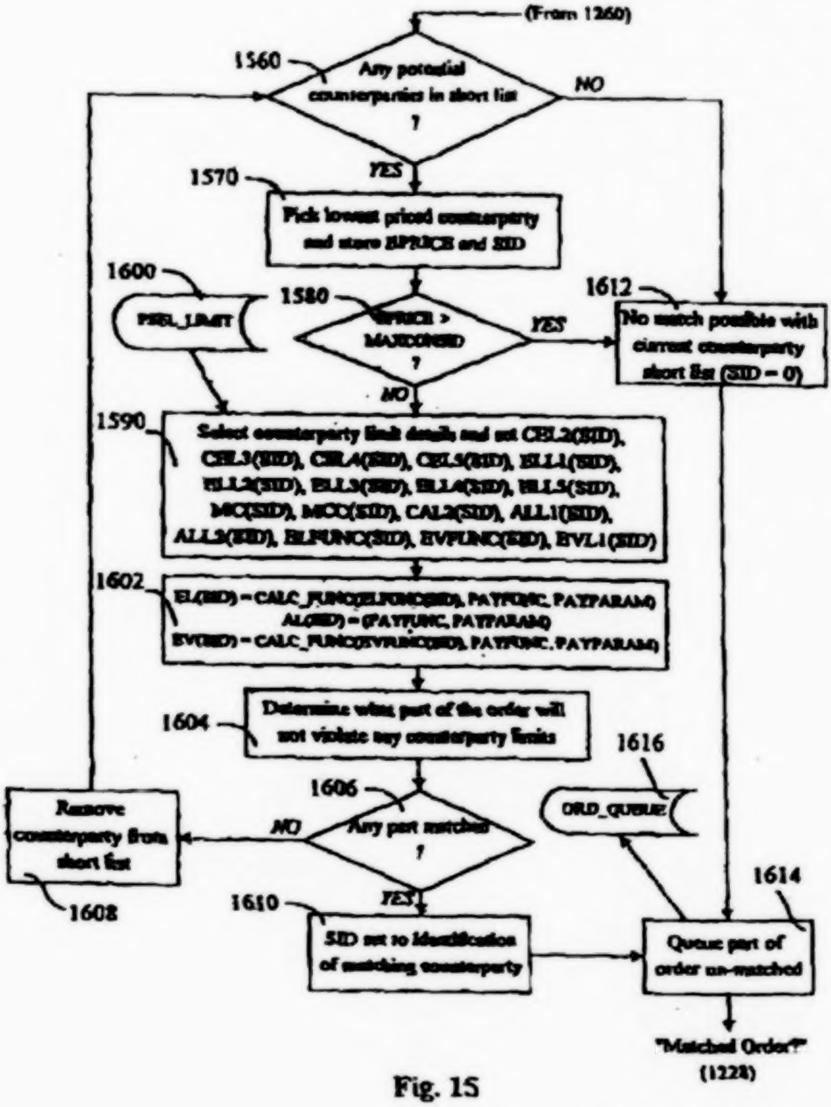

(From 1260)
1560
Any potential counterparties in short list ?
NO
YES
1570
Pick lowest priced counterparty and store BPRICE and SID
1600
PREL_LIMIT
1580
BPRICE > MAXCONSID ?
YES
1612
No match possible with current counterparty short list (SID = 0)
NO
1590
Select counterparty limit details and set CEL2(SID), CEL3(SID), CEL4(SID), CEL5(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), MC(SID), MCC(SID), CAL2(SID), ALL1(SID), ALL2(SID), ELFUNC(SID), EVFUNC(SID), EVL1(SID)
1602
EL(SID) = CALC_FUNC(ELFUNC(SID), PAYFUNC, PAYPARAM)
AL(SID) = (PAYFUNC, PAYPARAM)
EV(SID) = CALC_FUNC(EVFUNC(SID), PAYFUNC, PAYPARAM)
1604
Determine what part of the order will not violate any counterparty limits
1616
1606
ORD_QUEUE
NO
Any part matched ?
Remove counterparty from short list
1608
YES
1610
SID set to identification of matching counterparty
1614
Queue part of order un-matched
"Matched Order?" (1228)

Fig. 15

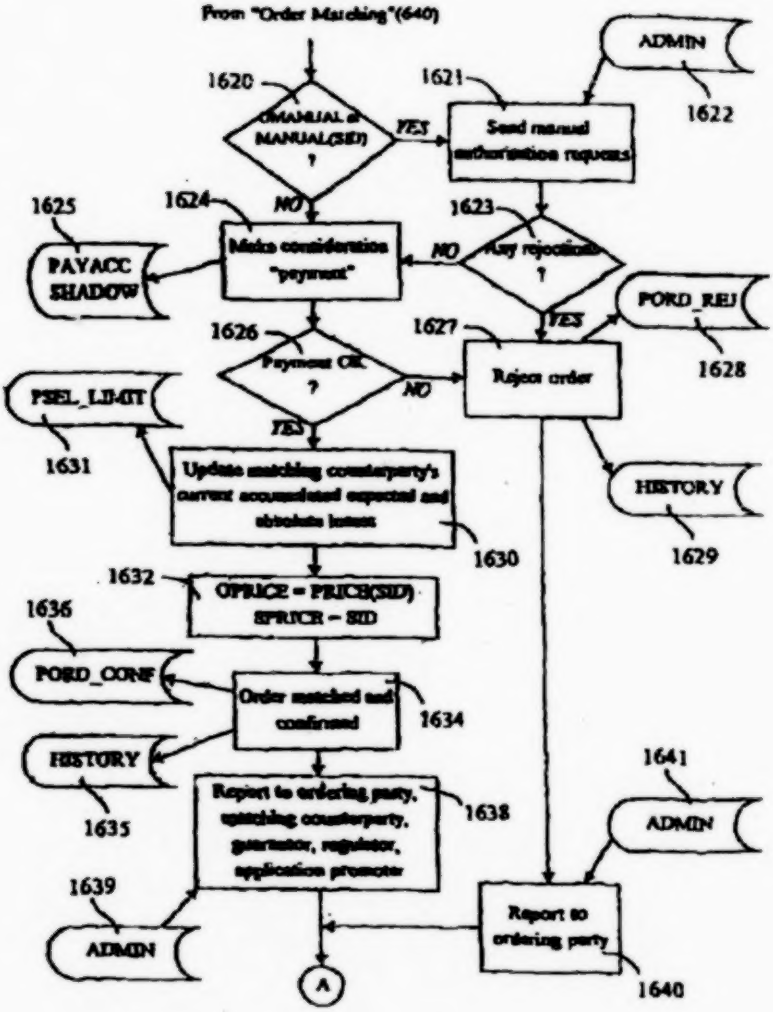

From "Order Matching"(640)
1620
OMANUAL or MANUAL(SID) ?
YES
NO
1621
Send manual authorization request
ADMIN
1622
1623
Any rejections ?
NO
YES
1624
Make consideration "payment"
1625
PAYACC SHADOW
1626
Payment OK ?
NO
YES
1627
Reject order
PORD_REJ
1628
HISTORY
1629
PSEL_LIMIT
1631
Update matching counterparty's current accumulated expected and absolute losses
1630
1632
OPRICE = PRICE(SID)
SPRICE – SID
1636
PORD_CONF
Order matched and confirmed
1634
HISTORY
1635
Report to ordering party, matching counterparty, guarantor, regulator, application promoter
1638
1639
ADMIN
1641
ADMIN
Report to ordering party
1640
A

Fig. 16

EXAMPLE III

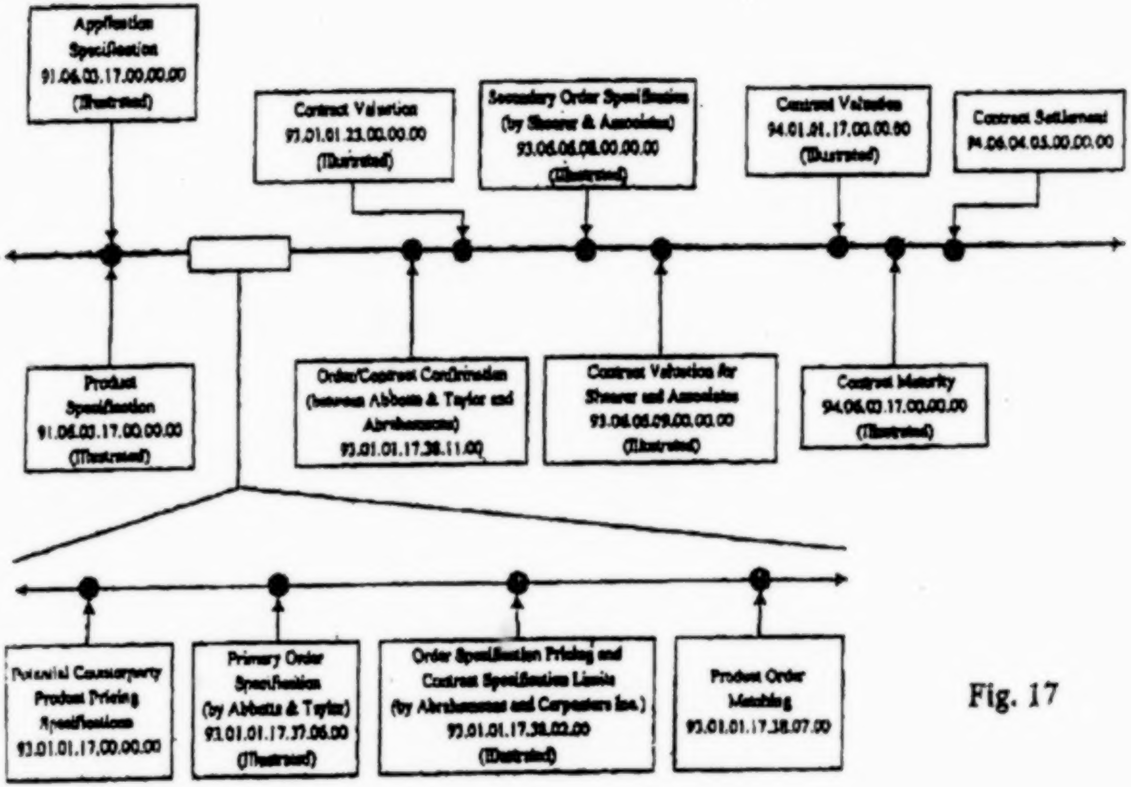

Application Specification 91.06.03.17.00.00.00 (Illustrated)
Contract Valuation 93.01.01.23.00.00.00 (Illustrated)
Secondary Order Specification (by Shearer & Associates) 93.06.06.08.00.00.00 (Illustrated)
Contract Valuation 94.01.01.17.00.00.00 (Illustrated)
Contract Settlement 94.06.04.05.00.00.00
Product Specification 91.06.03.17.00.00.00 (Illustrated)
Order/Contract Confirmation (between Abbotts & Taylor and Abrahamsons) 93.01.01.17.38.11.00
Contract Valuation for Shearer and Associates 93.06.06.09.00.00.00 (Illustrated)
Contract Maturity 94.06.03.17.00.00.00 (Illustrated)
Potential Counterparty Product Pricing Specifications 93.01.01.17.00.00.00
Primary Order Specification (by Abbotts & Taylor) 93.01.01.17.37.06.00 (Illustrated)
Order Specification Pricing and Contract Specification Limits (by Abrahamsons and Carpenters Inc.) 93.01.01.17.38.02.00 (Illustrated)
Product Order Matching 93.01.01.17.38.07.00

Fig. 17

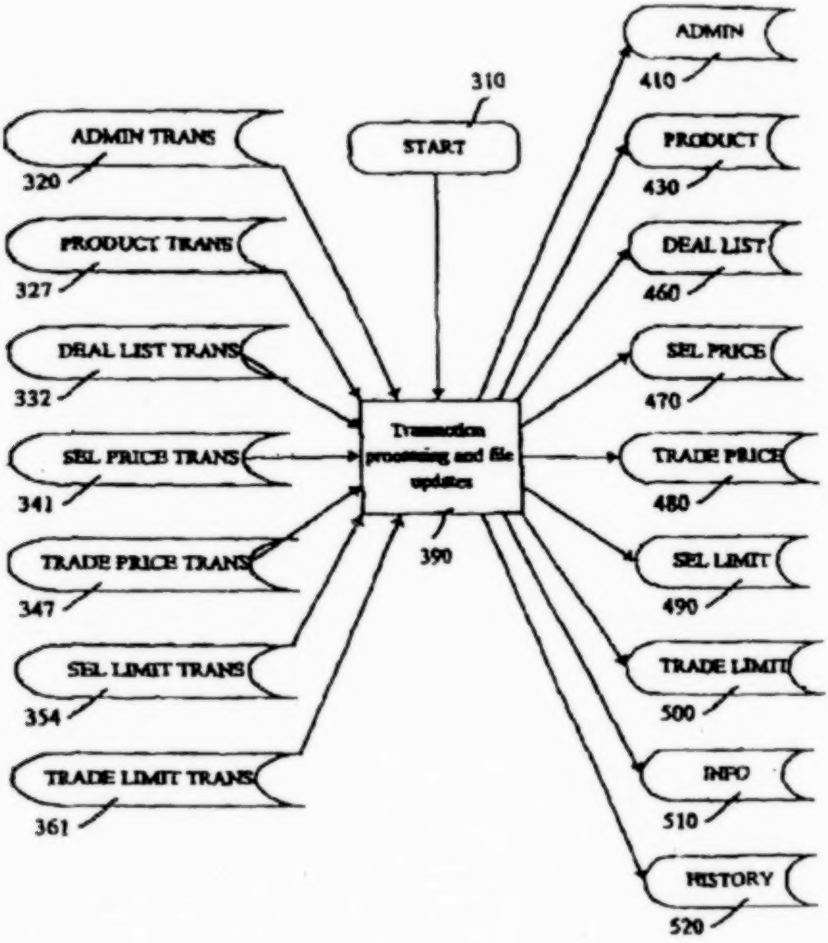

310
START
ADMIN TRANS
320
PRODUCT TRANS
327
DEAL LIST TRANS
332
SEL PRICE TRANS
341
TRADE PRICE TRANS
347
SEL LIMIT TRANS
354
TRADE LIMIT TRANS
361
Transaction processing and file updates
390
ADMIN
410
PRODUCT
430
DEAL LIST
460
SEL PRICE
470
TRADE PRICE
480
SEL LIMIT
490
TRADE LIMIT
500
INFO
510
HISTORY
520

Fig. 18

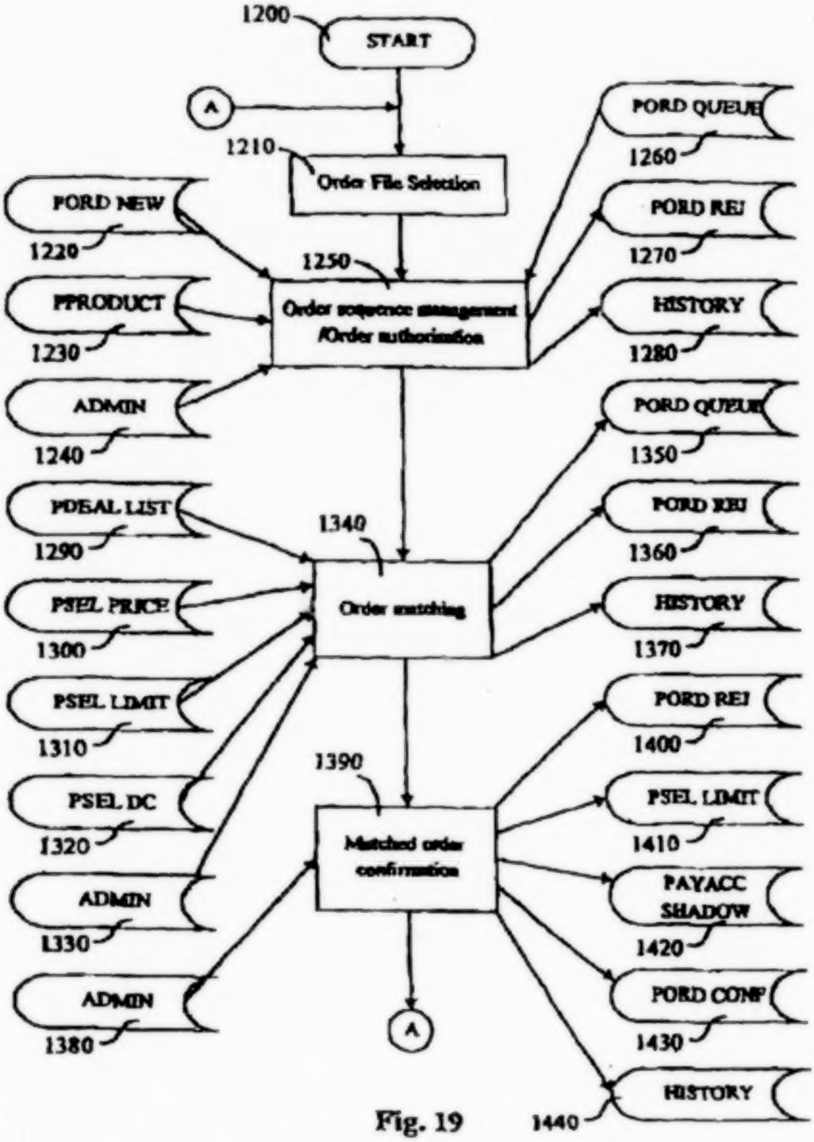

1200
START
A
1210
Order File Selection
PORD NEW
1220
PPRODUCT
1230
ADMIN
1240
1250
Order sequence management /Order authorization
PORD QUEUE
1260
PORD REJ
1270
HISTORY
1280
PDSAL LIST
1290
PSEL PRICE
1300
PSEL LIMIT
1310
PSEL DC
1320
ADMIN
1330
1340
Order matching
PORD QUEUE
1350
PORD REJ
1360
HISTORY
1370
1390
Matched order confirmation
ADMIN
1380
A
PORD REJ
1400
PSEL LIMIT
1410
PAYACC SHADOW
1420
PORD CONF
1430
HISTORY
1440

Fig. 19

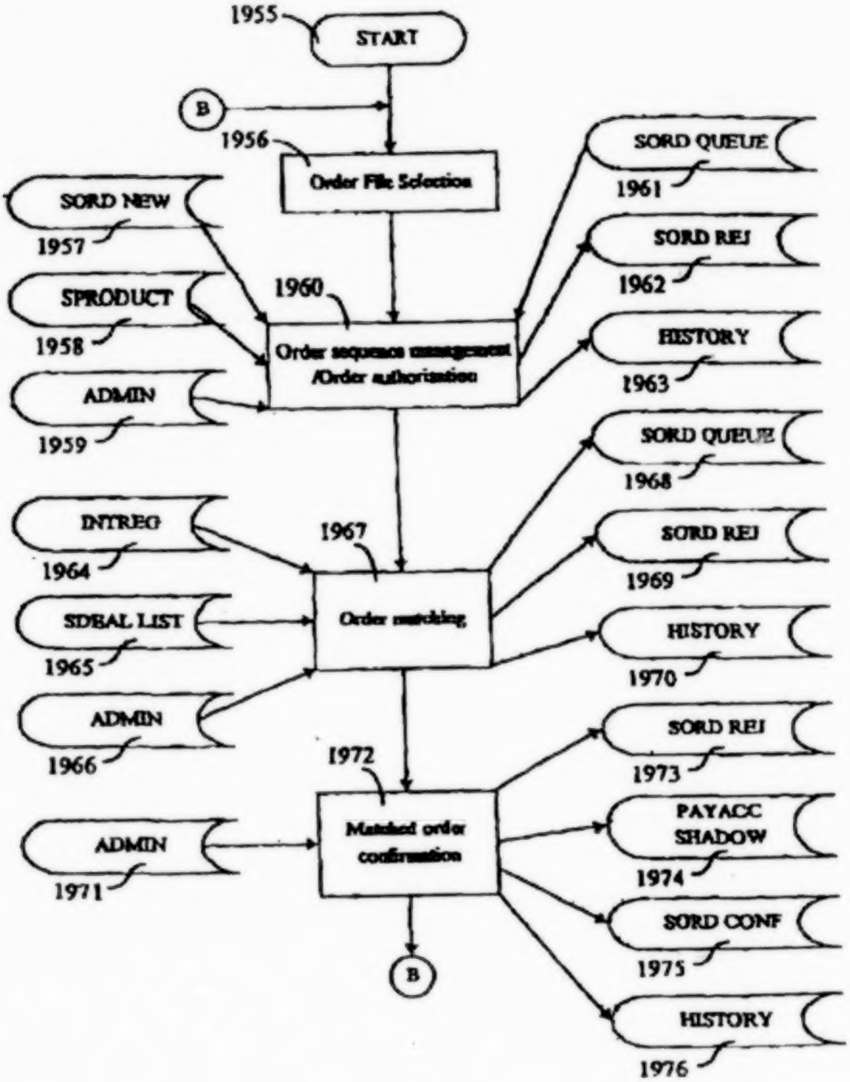

1955
START
B
1956
Order File Selection
SORD NEW
1957
SPRODUCT
1958
ADMIN
1959
1960
Order sequence management /Order authorisation
SORD QUEUE
1961
SORD REJ
1962
HISTORY
1963
INTREG
1964
SDEAL LIST
1965
ADMIN
1966
1967
Order matching
SORD QUEUE
1968
SORD REJ
1969
HISTORY
1970
ADMIN
1971
1972
Matched order confirmation
SORD REJ
1973
PAYACC SHADOW
1974
SORD CONF
1975
HISTORY
1976
B

Fig. 20

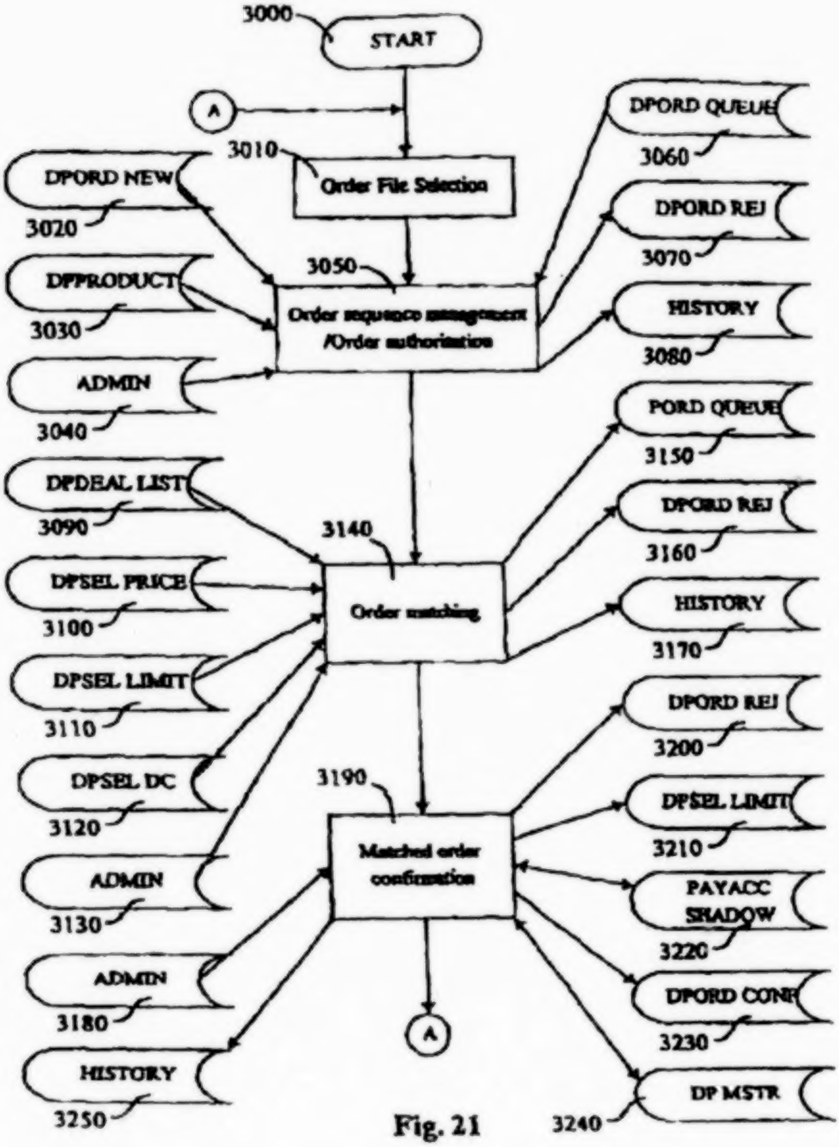

3000
START
A
3010
Order File Selection
DPORD NEW
3020
DPPRODUCT
3030
ADMIN
3040
3050
Order sequence management /Order authorization
DPORD QUEUE
3060
DPORD REJ
3070
HISTORY
3080
DPDEAL LIST
3090
3140
Order matching
DPSEL PRICE
3100
DPSEL LIMIT
3110
DPSEL DC
3120
ADMIN
3130
PORD QUEUE
3150
DPORD REJ
3160
HISTORY
3170
3190
Matched order confirmation
ADMIN
3180
HISTORY
3250
A
DPORD REJ
3200
DPSEL LIMIT
3210
PAYACC SHADOW
3220
DPORD CONF
3230
DP MSTR
3240

Fig. 21

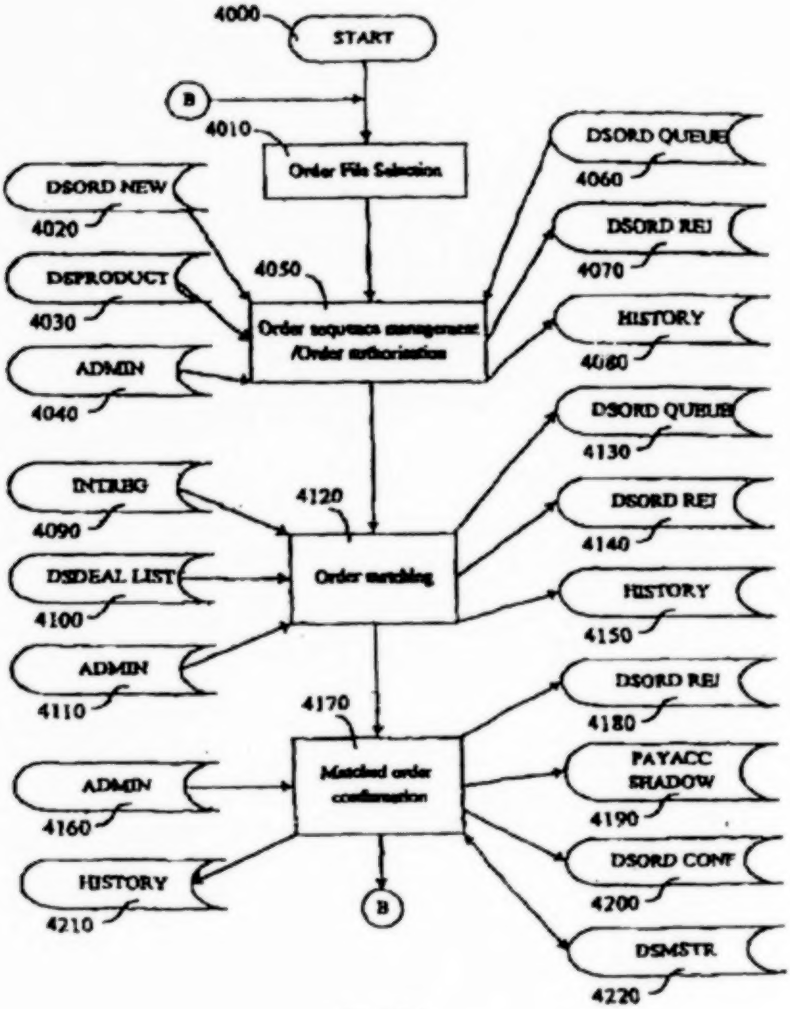

4000
START
B
4010
Order File Selection
DSORD NEW
4020
DSPRODUCT
4030
ADMIN
4040
4050
Order sequence management /Order authorisation
DSORD QUEUE
4060
DSORD REJ
4070
HISTORY
4080
INTREG
4090
DSDEAL LIST
4100
ADMIN
4110
4120
Order matching
DSORD QUEUE
4130
DSORD REJ
4140
HISTORY
4150
4170
ADMIN
4160
Matched order confirmation
DSORD REJ
4180
PAYACC SHADOW
4190
DSORD CONF
4200
HISTORY
4210
B
DSMSTR
4220

Fig. 22

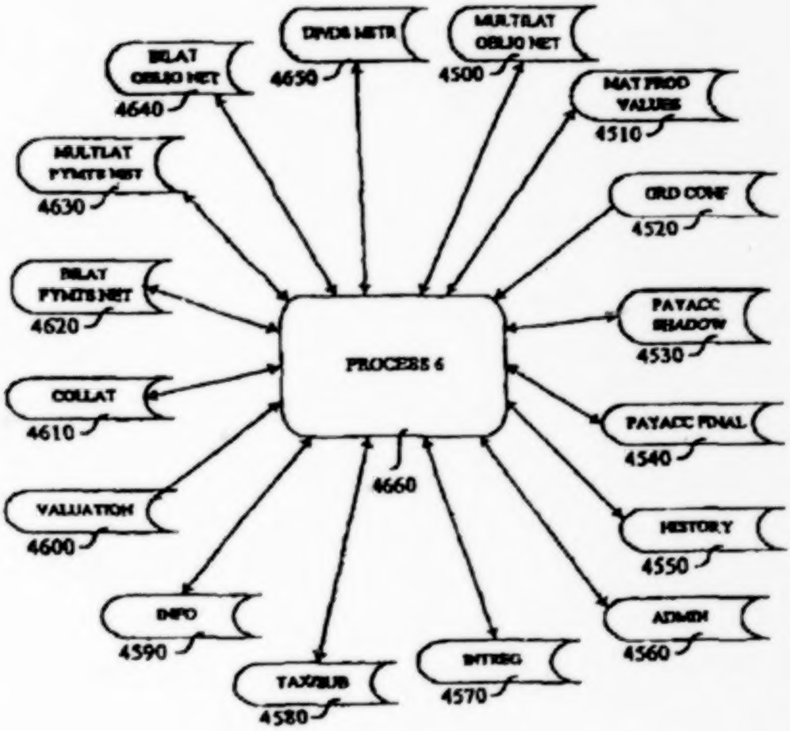

DIVDS MSTR
4650
MULTILAT OBLIG NET
4500
BILAT OBLIG NET
4640
MAT PROD VALUES
4510
MULTILAT PYMTS NET
4630
ORD CONF
4520
BILAT PYMTS NET
4620
PAYACC SHADOW
4530
PROCESS 6
COLLAT
4610
PAYACC FINAL
4540
4660
VALUATION
4600
HISTORY
4550
INFO
4590
ADMIN
4560
INTREG
4570
TAX/SUB
4580

Fig. 23

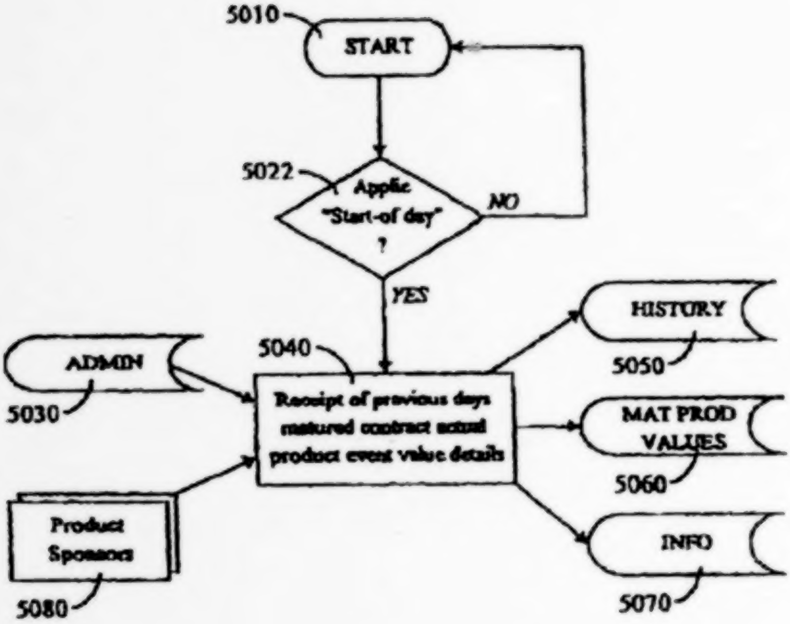

5010
START
5022
Applic "Start-of day" ?
NO
YES
5040
Receipt of previous days matured contract actual product event value details
ADMIN
5030
Product Sponsors
5080
HISTORY
5050
MAT PROD VALUES
5060
INFO
5070

Fig. 24

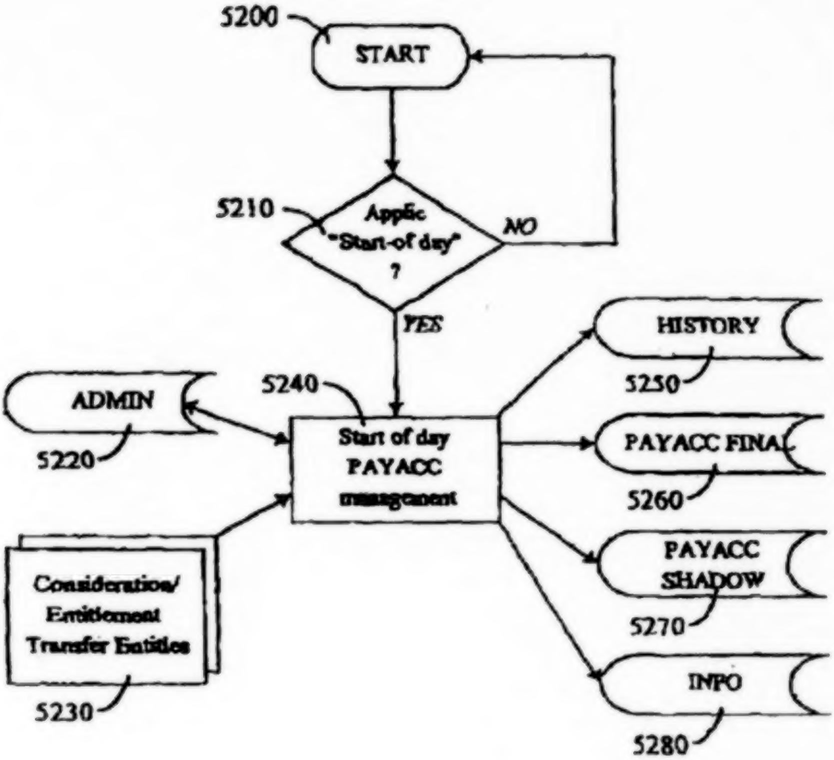

5200
START
5210
Applic "Start-of day" ?
NO
YES
5240
Start of day PAYACC management
ADMIN
5220
Consideration/ Entitlement Transfer Entities
5230
HISTORY
5250
PAYACC FINAL
5260
PAYACC SHADOW
5270
INFO
5280

Fig. 25

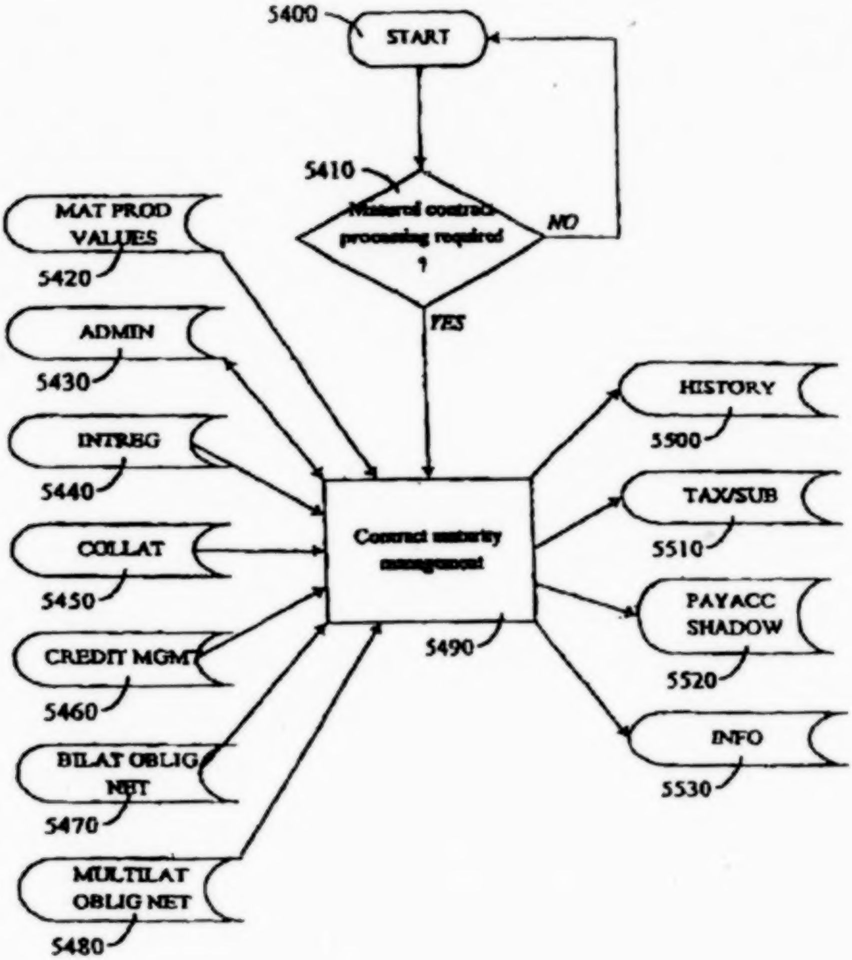

5400
START
5410
Matured contract processing required ?
NO
YES
MAT PROD VALUES
5420
ADMIN
5430
INTREG
5440
COLLAT
5450
CREDIT MGMT
5460
BILAT OBLIG NET
5470
MULTILAT OBLIG NET
5480
Contract maturity management
5490
HISTORY
5500
TAX/SUB
5510
PAYACC SHADOW
5520
INFO
5530

Fig. 26

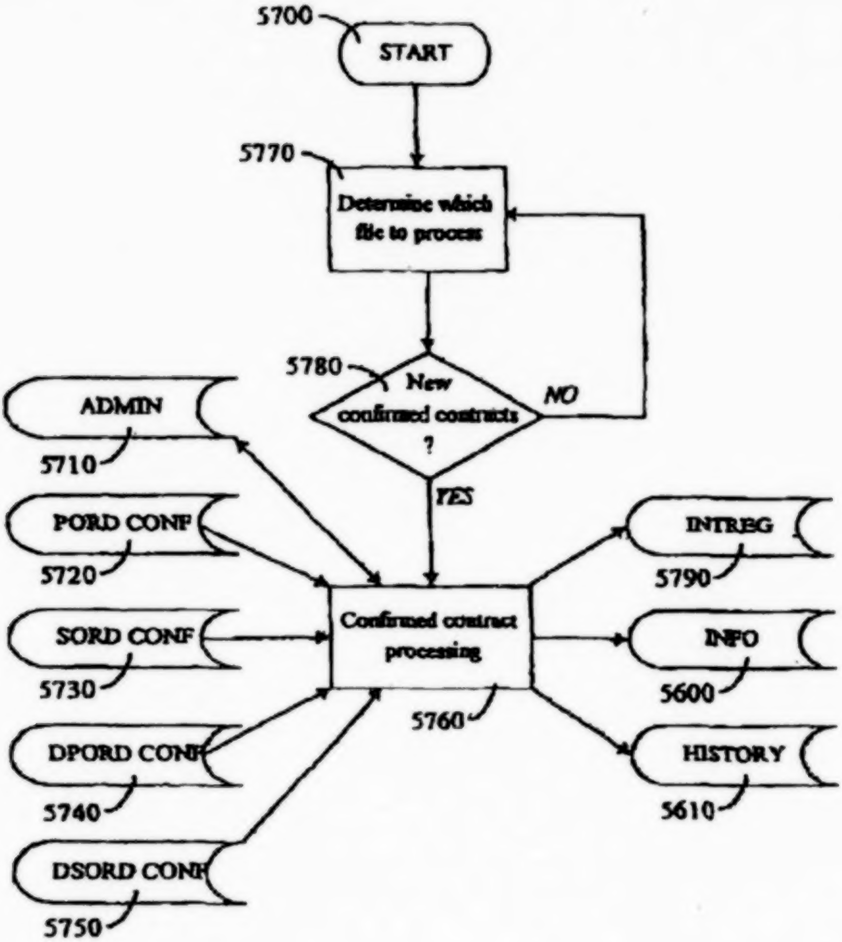
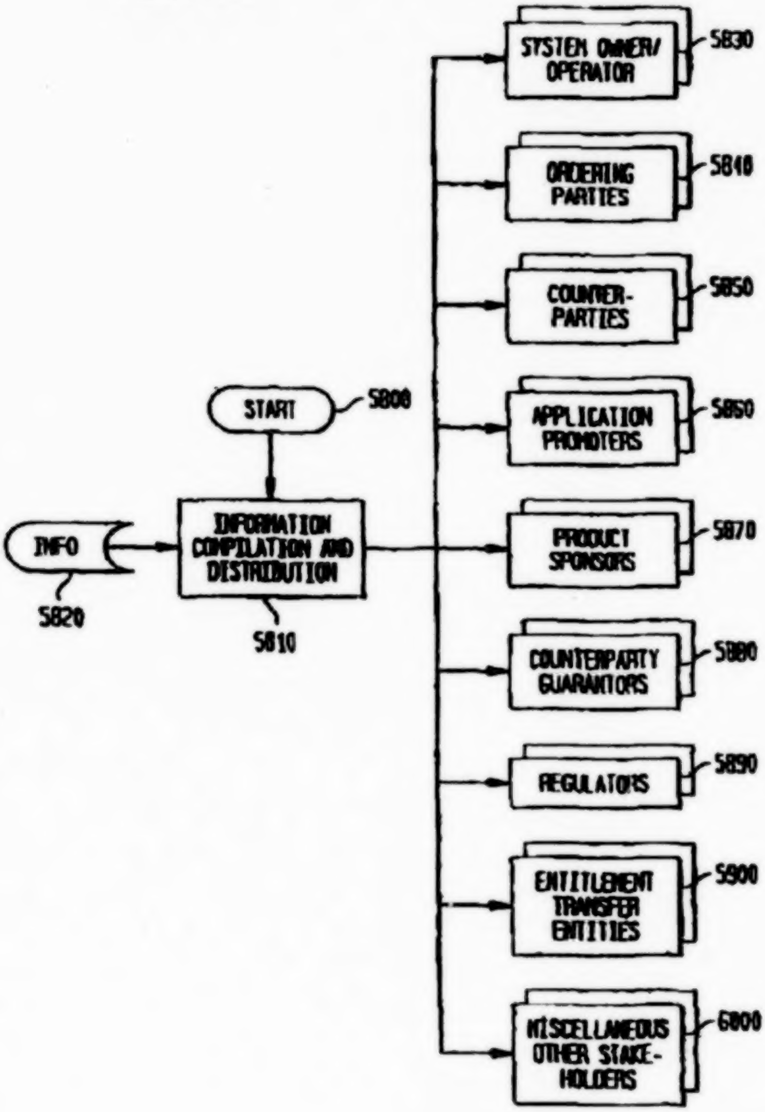

5700
START
5770
Determine which file to process
5780
New confirmed contracts ?
NO
YES
ADMIN
5710
PORD CONF
5720
SORD CONF
5730
DPORD CONF
5740
DSORD CONF
5750
Confirmed contract processing
5760
INTREG
5790
INFO
5600
HISTORY
5610

Fig 27

FIG. 28


START
5800
INFO
5820
INFORMATION COMPILATION AND DISTRIBUTION
5810
SYSTEM OWNER/ OPERATOR
5830
ORDERING PARTIES
5840
COUNTER-PARTIES
5850
APPLICATION PROMOTERS
5860
PRODUCT SPONSORS
5870
COUNTERPARTY GUARANTORS
5880
REGULATORS
5890
ENTITLEMENT TRANSFER ENTITIES
5900
MISCELLANEOUS OTHER STAKE-HOLDERS
6000

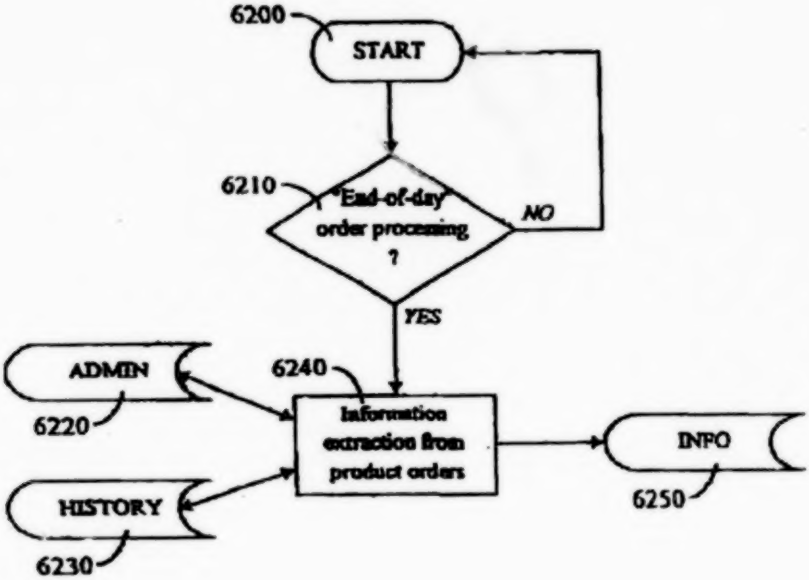

6200
START
6210
"End-of-day" order processing ?
NO
YES
ADMIN
6220
6240
Information extraction from product orders
INFO
6250
HISTORY
6230

Fig. 29

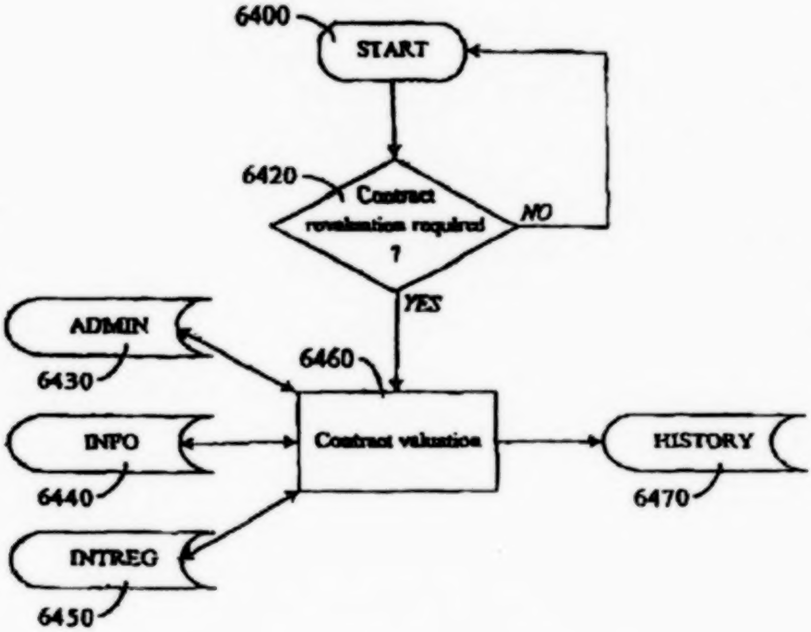

6400
START
6420
Contract revaluation required ?
NO
YES
ADMIN
6430
6460
INFO
Contract valuation
HISTORY
6440
6470
INTREG
6450

Fig. 30

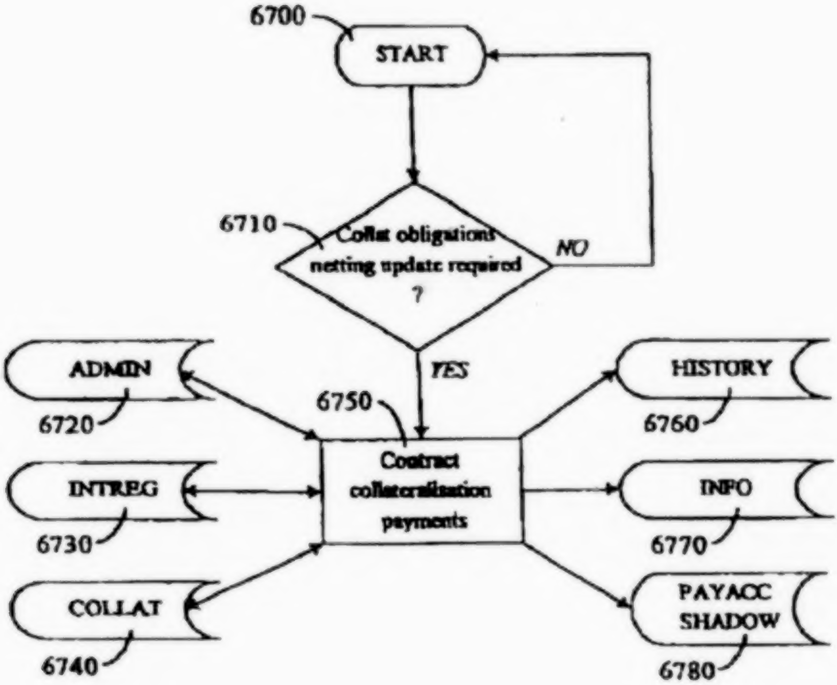

6700
START
6710
Collat obligations netting update required ?
NO
YES
ADMIN
6720
INTREG
6730
COLLAT
6740
6750
Contract collateralisation payments
HISTORY
6760
INFO
6770
PAYACC SHADOW
6780

Fig. 31

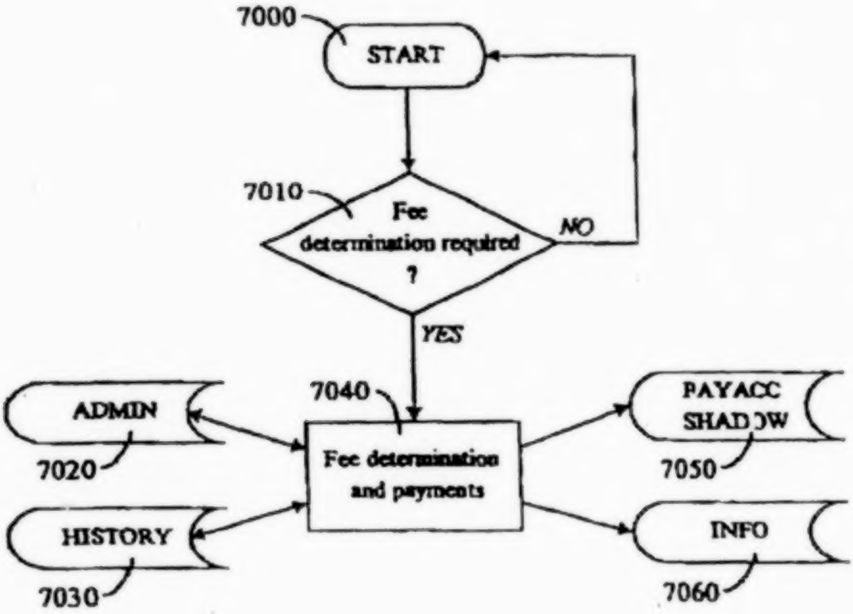

7000
START
7010
Fee determination required ?
NO
YES
7040
Fee determination and payments
ADMIN
7020
HISTORY
7030
PAYACC SHADOW
7050
INFO
7060

Fig. 32

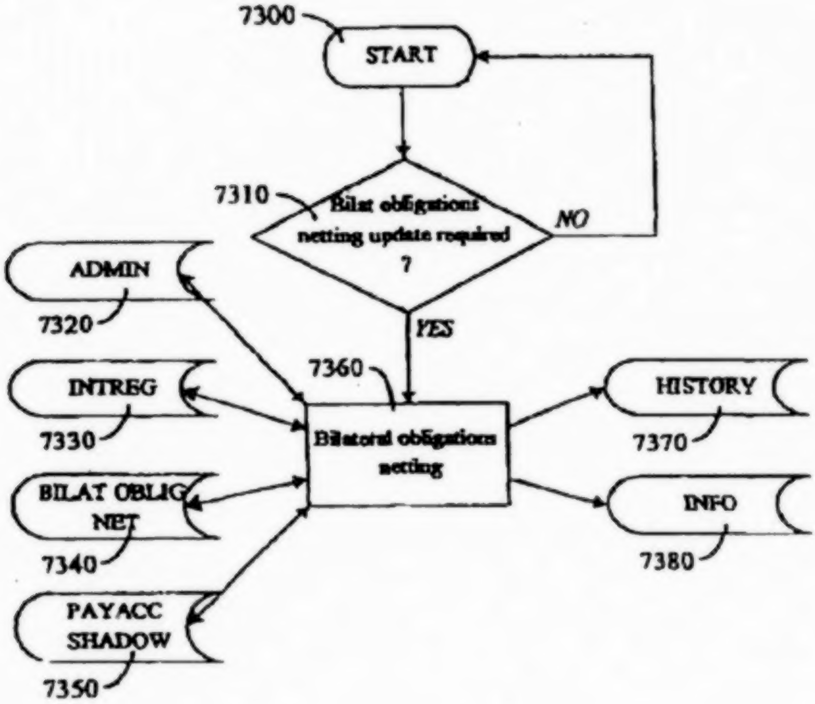

7300
START
7310
Bilat obligations netting update required ?
NO
YES
ADMIN
7320
INTREG
7330
BILAT OBLIG NET
7340
PAYACC SHADOW
7350
7360
Bilateral obligations netting
HISTORY
7370
INFO
7380

Fig. 33

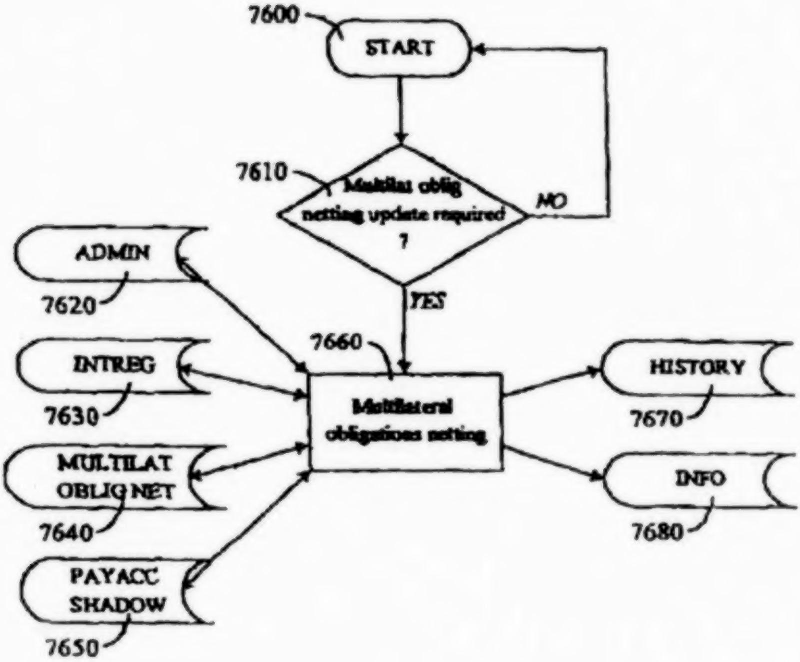
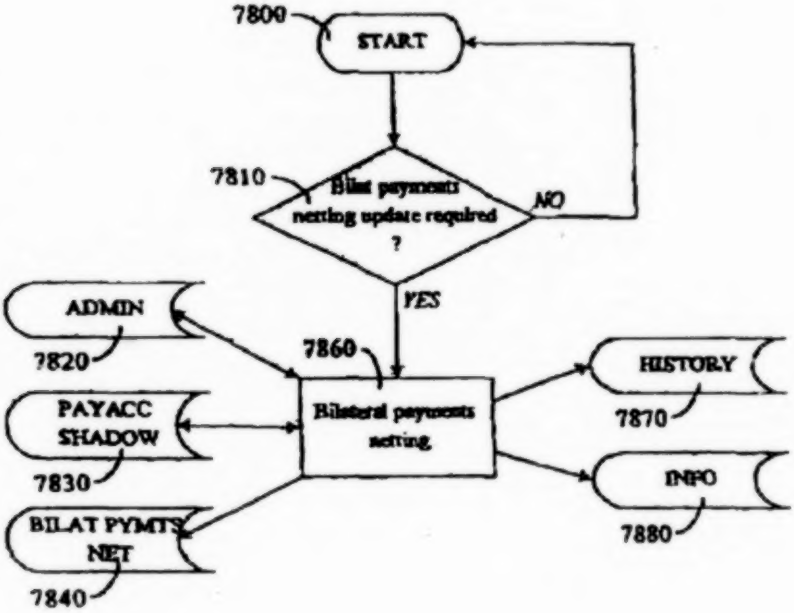

7600
START
7610
Multilat oblig netting update required ?
NO
YES
ADMIN
7620
INTREG
7630
MULTILAT OBLIG NET
7640
PAYACC SHADOW
7650
7660
Multilateral obligations netting
HISTORY
7670
INFO
7680

Fig. 34



7800
START
7810
Bilat payments netting update required ?
NO
YES
ADMIN
7820
7860
Bilateral payments netting
HISTORY
7870
PAYACC SHADOW
7830
INFO
7880
BILAT PYMTS NET
7840

Fig. 35

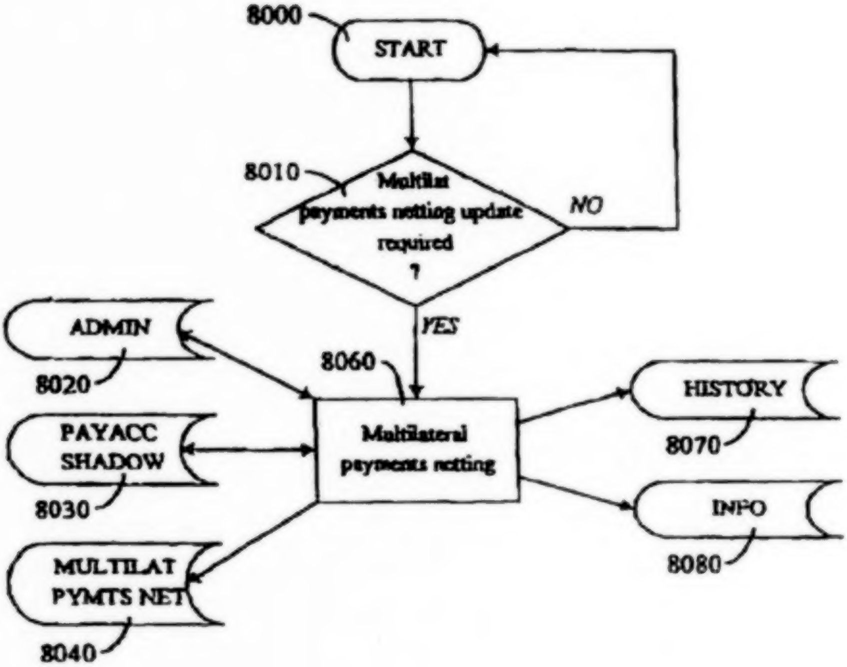

8000
START
8010
Multilat payments netting update required ?
NO
YES
ADMIN
8020
8060
PAYACC SHADOW
8030
Multilateral payments netting
HISTORY
8070
INFO
8080
MULTILAT PYMTS NET
8040

Fig. 36

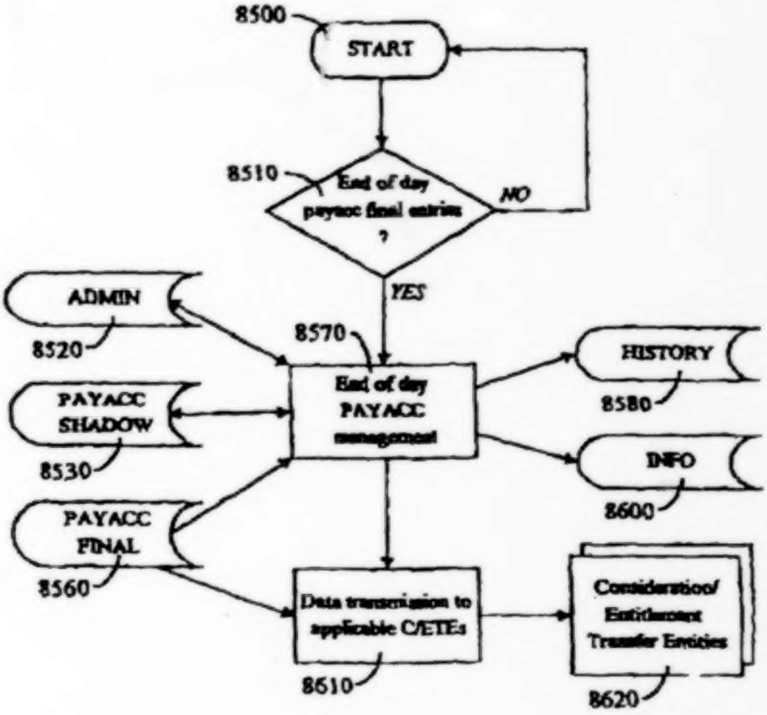

8500
START
8510
End of day payacc final entries ?
NO
YES
ADMIN
8520
8570
End of day PAYACC management
PAYACC SHADOW
8530
PAYACC FINAL
8560
HISTORY
8580
INFO
8600
Data transmission to applicable C/ETEs
8610
Consideration/ Entitlement Transfer Entities
8620

Fig. 37

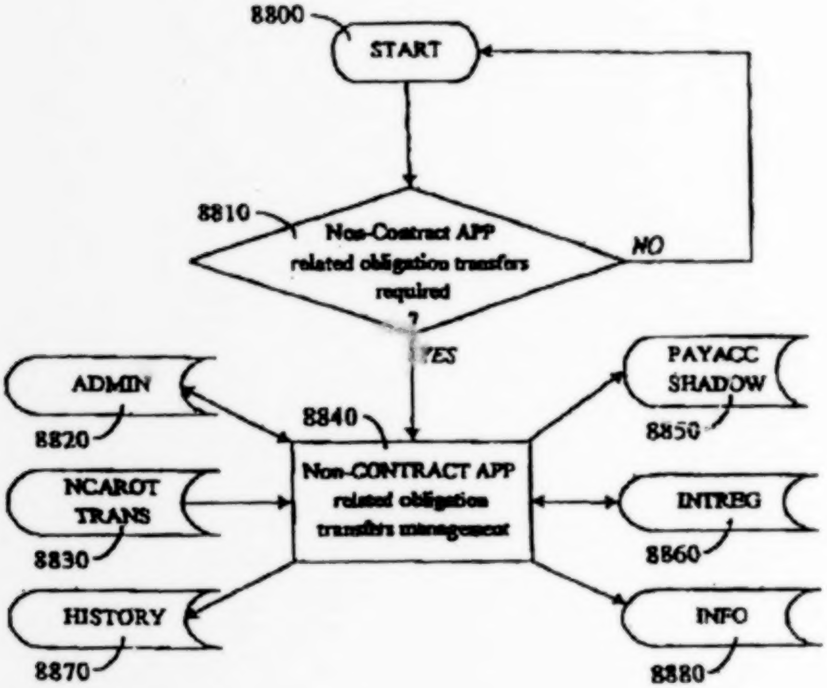

8800
START
8810
Non-Contract APP related obligation transfers required ?
NO
YES
ADMIN
8820
NCAROT TRANS
8830
HISTORY
8870
8840
Non-CONTRACT APP related obligation transfers management
PAYACC SHADOW
8850
INTREG
8860
INFO
8880

Fig. 38

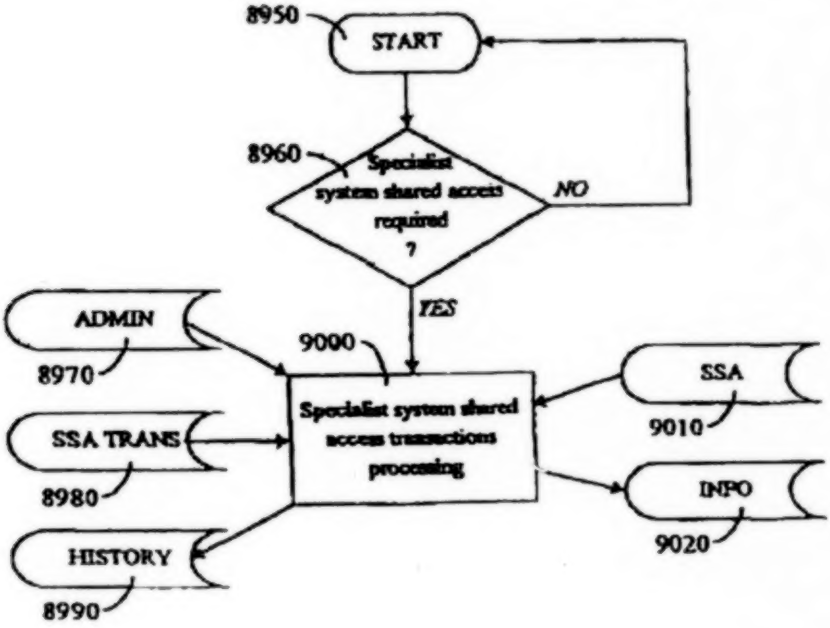

8950
START
8960
Specialist system shared access required ?
NO
YES
ADMIN
8970
SSA TRANS
8980
HISTORY
8990
9000
Specialist system shared access transactions processing
SSA
9010
INFO
9020

Fig. 39

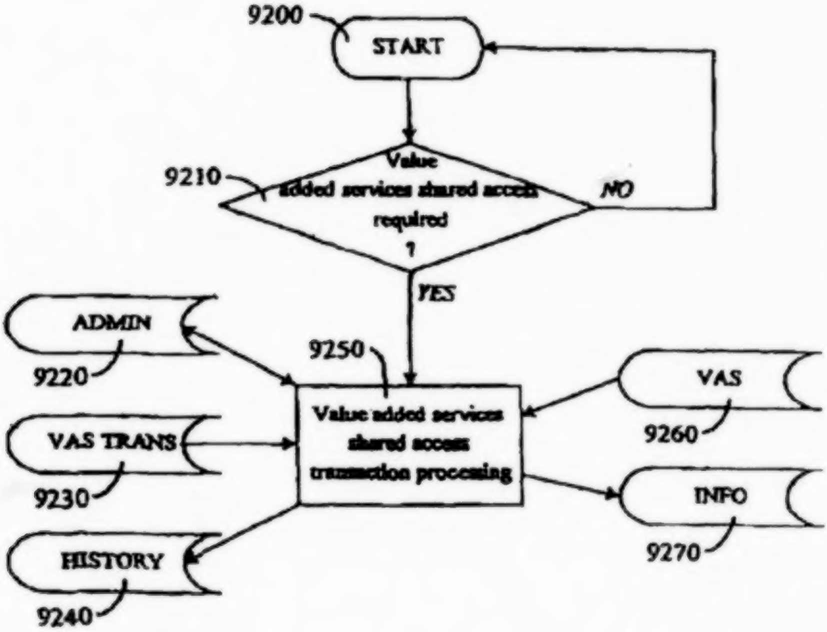

9200
START
9210
Value added services shared access required ?
NO
YES
ADMIN
9220
VAS TRANS
9230
HISTORY
9240
9250
Value added services shared access transaction processing
VAS
9260
INFO
9270

Fig. 40

EXAMPLE IV

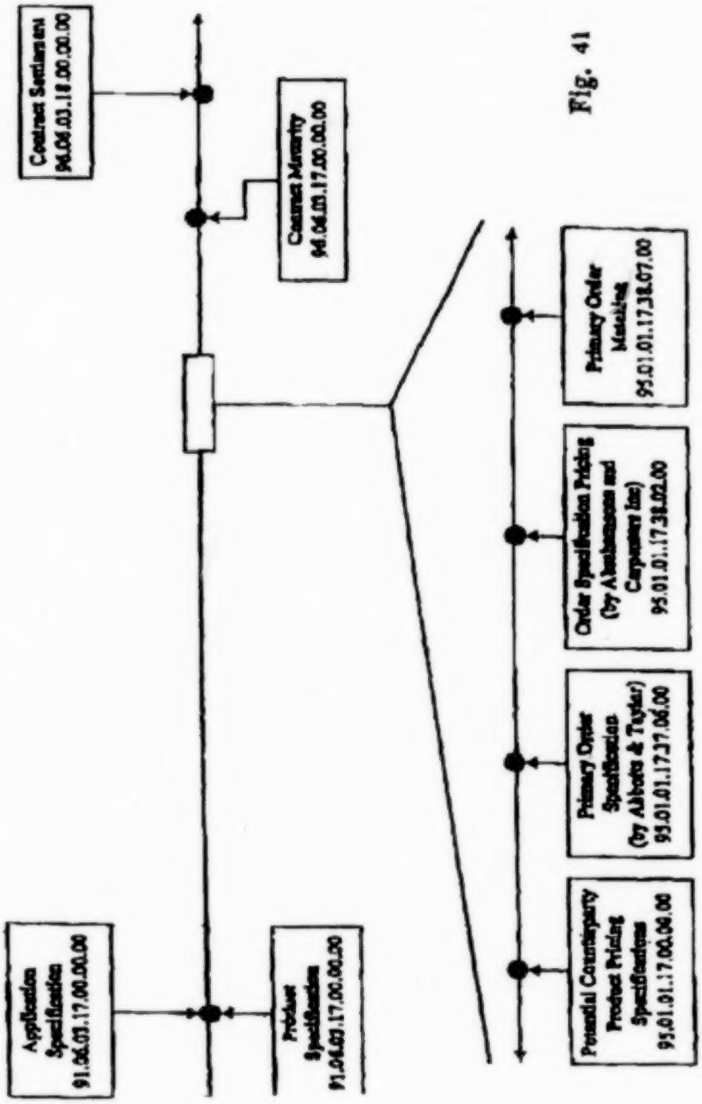

Contract Settlement
96.06.03.18.00.00.00
Contract Maturity
96.06.03.17.00.00.00
Application Specification
91.06.03.17.00.00.00
Product Specification
91.04.03.17.00.00.00
Primary Order Matching
95.01.01.17.38.07.00
Order Specification Pricing (by Abrahamson and Carpenter Inc)
95.01.01.17.38.02.00
Primary Order Specification (by Abbott & Taylor)
95.01.01.17.37.06.00
Potential Counterparty Product Pricing Specifications
95.01.01.17.00.06.00

Fig. 41

EXAMPLE V

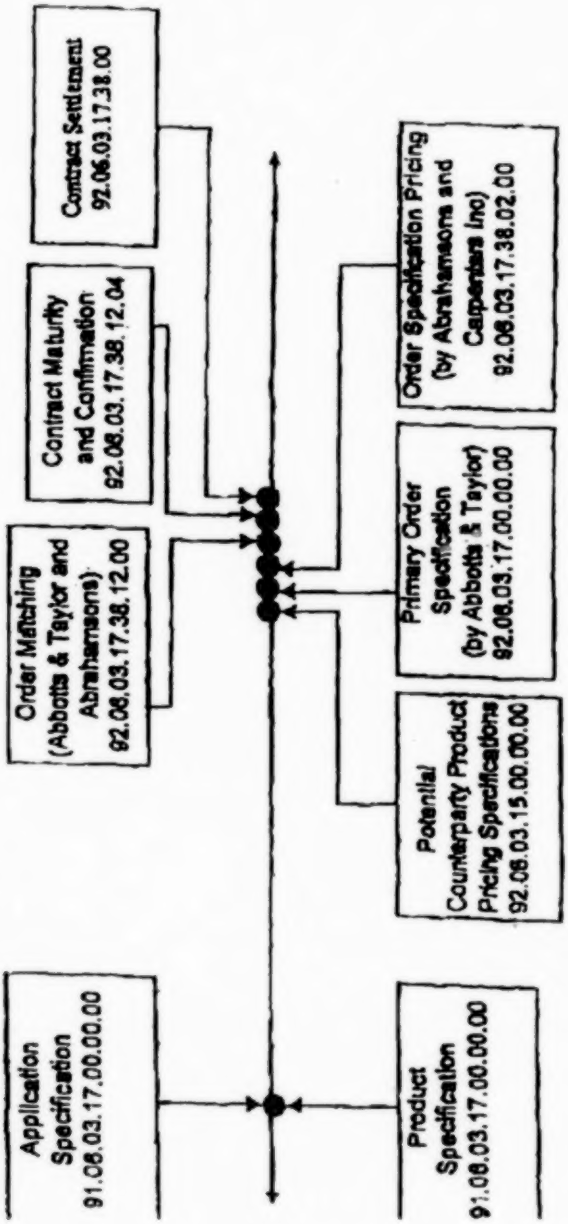
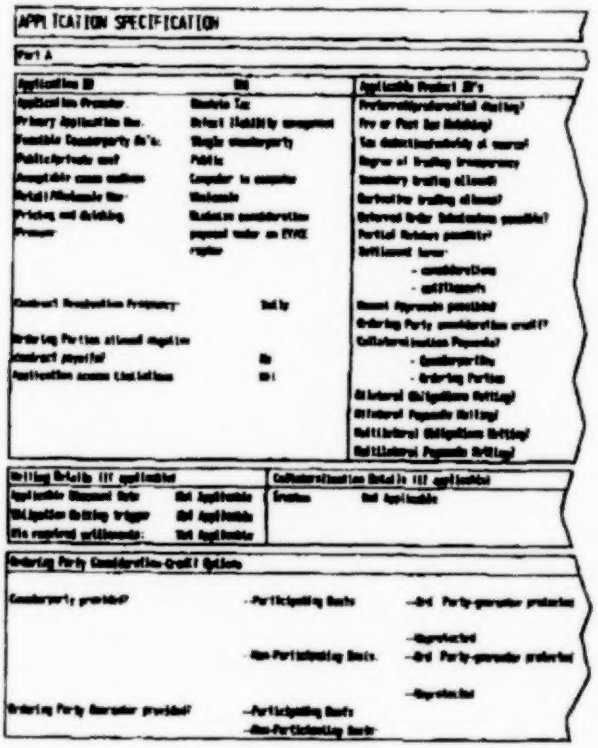

Application Specification 91.08.03.17.00.00.00
Product Specification 91.08.03.17.00.00.00
Order Matching (Abbotts & Taylor and Abrahamsons) 92.08.03.17.38.12.00
Contract Maturity and Confirmation 92.08.03.17.38.12.04
Contract Settlement 92.06.03.17.38.00
Potential Counterparty Product Pricing Specifications 92.08.03.15.00.00.00
Primary Order Specification (by Abbotts & Taylor) 92.08.03.17.00.00.00
Order Specification Pricing (by Abrahamsons and Carpenters Inc) 92.08.03.17.38.02.00

Fig. 42

FIG. 43A



APPLICATION SPECIFICATION

Part A

Application ID	001
Application Promoter:	[illegible] Inc
Primary Application Use:	Default liability management
Possible Counterparty ID's:	Single counterparty
Public/private use?	Public
Acceptable comm medium	Computer to computer
Retail/Wholesale Use:	Wholesale
Pricing and matching Process:	[illegible] consideration payout under an [illegible] regime
Contract Resolution Frequency:	Daily
Ordering Parties allowed negative contract payoffs?	No
Application access limitations	Nil

Applicable Product ID's

- Preferred/preferential dealing?
- Pre or Post Tax Matching?
- Tax deduction/authority at source?
- Degree of trading transparency
- Secondary trading allowed?
- Derivative trading allowed?
- Deferred Order Submissions possible?
- Partial Matches possible?
- Settlement terms:
  - considerations
  - entitlements
- Basket Approvals permitted
- Ordering Party consideration credit?
- Collateralization Payments?
  - Counterparties
  - Ordering Parties
- Bilateral Obligations Netting?
- Bilateral Payments Netting?
- Multilateral Obligations Netting?
- Multilateral Payments Netting?

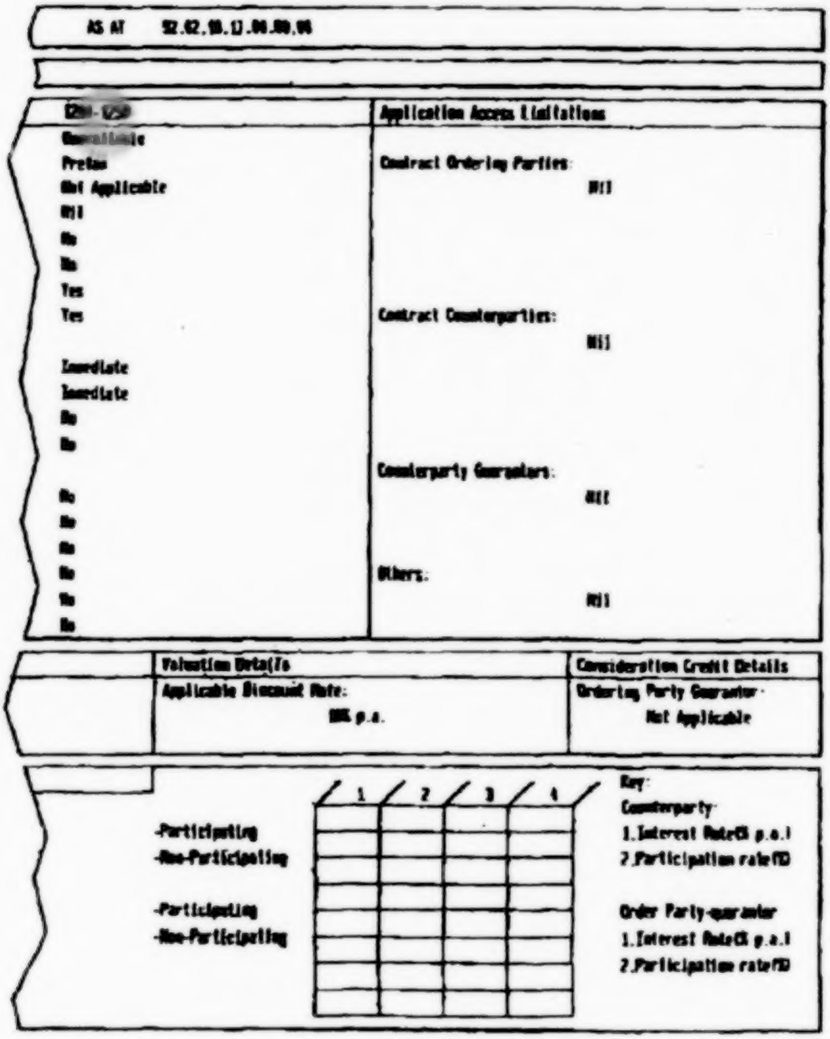
Netting Details (If applicable)	
Applicable Discount Rate	Not Applicable
Obligation Netting trigger	Not Applicable
Pre-required entitlements:	Not Applicable

Collateralization Details (If applicable)	
[illegible]	Not Applicable

Ordering Party Consideration-Credit Options

Counterparty provided?	-Participating Banks	—3rd Party-guarantor protected —Unprotected
	-Non-Participating Banks	—3rd Party-guarantor protected —Unprotected
Ordering Party Guarantor provided?	—Participating Banks —Non-Participating Banks	

FIG. 43B



AS AT 52.02.10.13.00.00.00

[illegible]

[illegible]

Prelas

Not Applicable

Nil

No

No

Yes

Yes

Immediate

Immediate

No

No

No

No

No

No

No

No

Application Access Limitations

Contract Ordering Parties:

Nil

Contract Counterparties:

Nil

Counterparty Guarantors:

Nil

Others:

Nil

Valuation Details

Applicable Discount Rate:

10% p.a.

Consideration Credit Details

Ordering Party Guarantor:

Not Applicable

1
2
3
4
-Participating
-Non-Participating
-Participating
-Non-Participating

Key:

Counterparty:

1.Interest Rate(% p.a.)

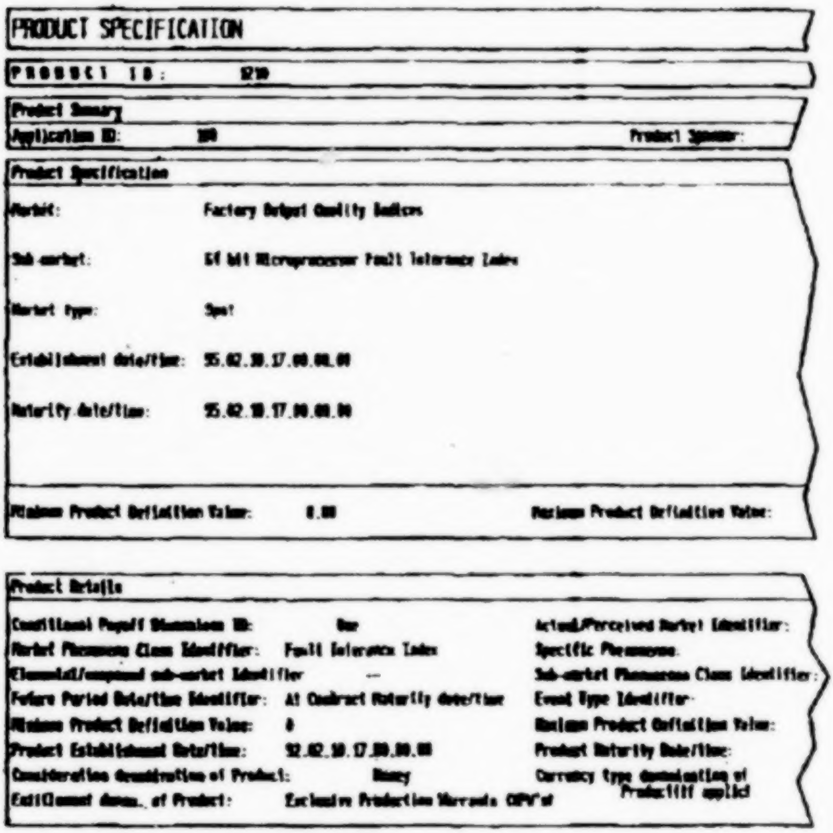
2.Participation rate(%)

Order Party-guarantor

1.Interest Rate(% p.a.)

2.Participation rate(%)

FIG. 44A



PRODUCT SPECIFICATION

PRODUCT ID: 1210

Product Summary

Application ID: 100 Product Sponsor:

Product Specification

Market: Factory Output Quality Indices

Sub-market: 64 bit Microprocessor Fault Tolerance Index

Market type: Spot

Establishment date/time: 95.02.10.17.00.00.00

Maturity date/time: 95.02.10.17.00.00.00

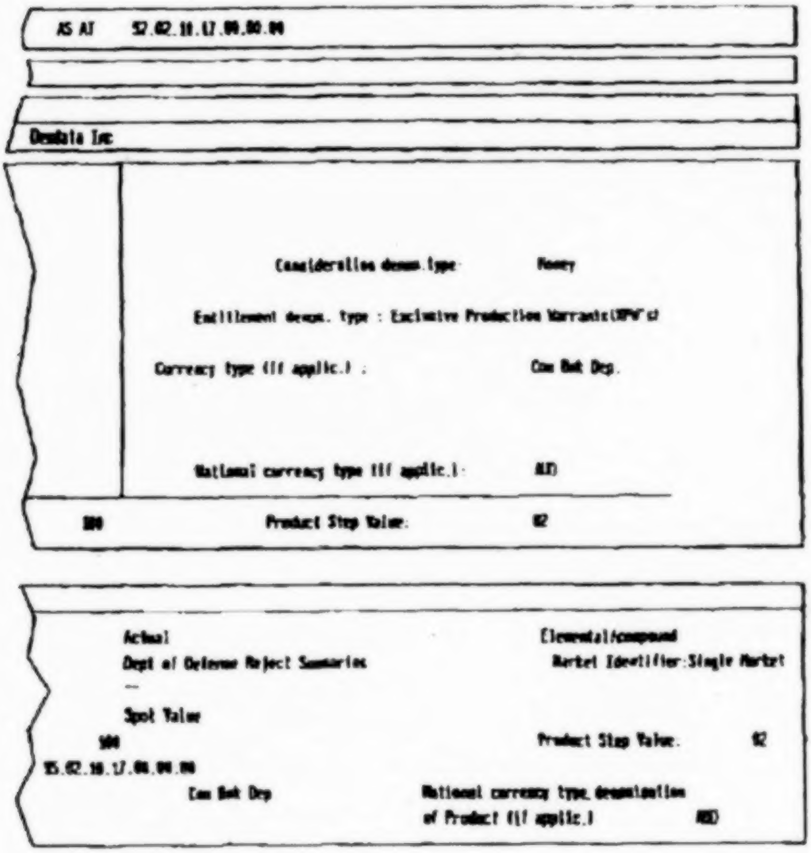
Minimum Product Definition Value: 0.00 Maximum Product Definition Value:

Product Details

Conditional Payoff Dimension ID: One
Market Phenomena Class Identifier: Fault Tolerance Index
Elemental/compound sub-market Identifier —
Future Period Date/time Identifier: At Contract Maturity date/time
Minimum Product Definition Value: 0
Product Establishment Date/time: 92.02.10.17.00.00.00
Consideration denomination of Product: Money
Entitlement denom. of Product: Exclusive Production Warrants CUPV'd

Actual/Perceived Market Identifier:
Specific Phenomena:
Sub-market Phenomena Class Identifier:
Event Type Identifier:
Maximum Product Definition Value:
Product Maturity Date/time:
Currency type denomination of Product(if applic)

FIG. 44B



AS AT 52.02.10.17.00.00.00

Dembla Inc

Consideration denom. type: Money

Entitlement denom. type : Exclusive Production Warrants(EPW's)

Currency type (if applic.) : Con Bnk Dep.

National currency type (if applic.): AUD

100 Product Step Value: $2

Actual

Elemental/compound

Dept of Defense Reject Summaries

Market Identifier:Single Market

—

Spot Value

100

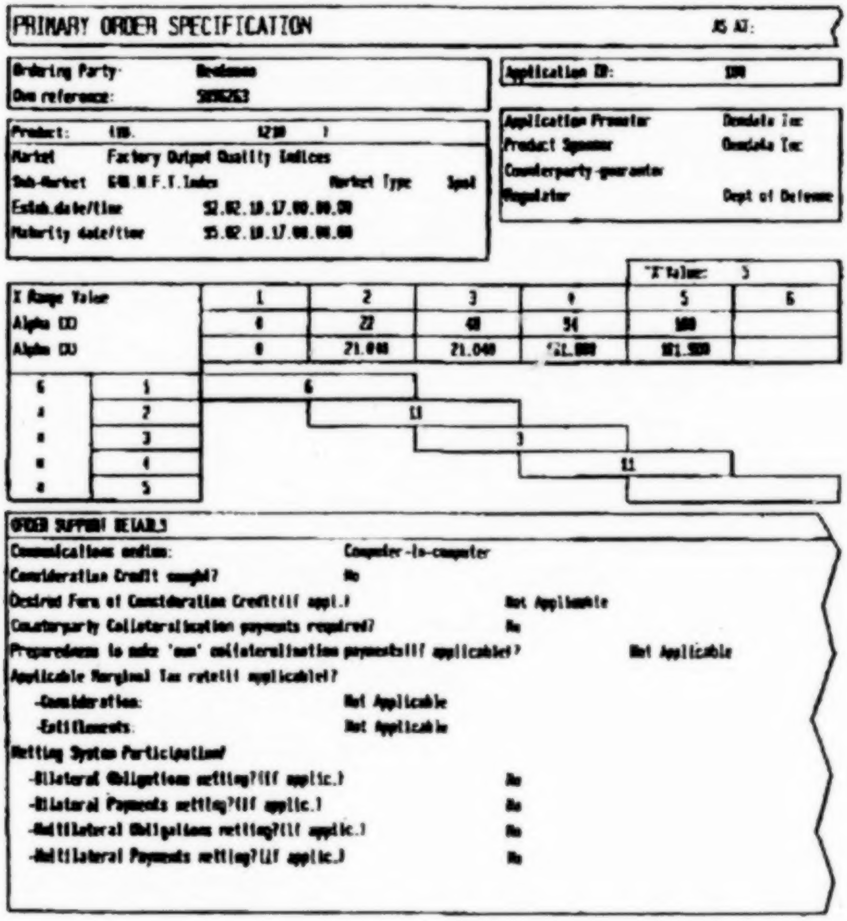
Product Step Value: $2

55.02.10.17.00.00.00

Con Bnk Dep

National currency type, denomination of Product (if applic.) AUD

FIG. 45A



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: Beckmann
Own reference: 5896263

Application ID: 100

Product: (IB. 1210)
Market Factory Output Quality Indices
Sub-Market 648.H.F.T.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Application Promoter Dendale Inc
Product Sponsor Dendale Inc
Counterparty-guarantor
Regulator Dept of Defense

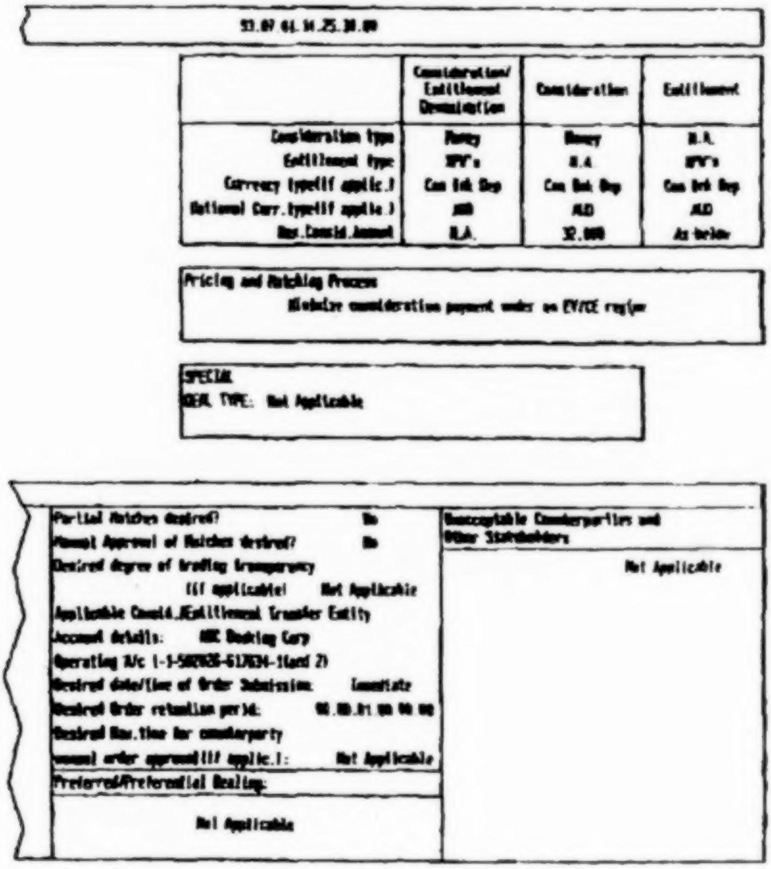
"X" Value: 3

X Range Value	1	2	3	4	5	6
Alpha (X)	0	22	48	54	100	
Alpha (U)	0	21.040	21.040	21.000	101.500	

6	1	6
a	2	11
a	3	3
a	4	11
a	5	

ORDER SUPPORT DETAILS
Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? No
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 45B



53.07 01.14.25.30.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Consideration type	Money	Money	N.A.
Entitlement type	SPV's	N.A	SPV's
Currency type(if applic.)	Cen Bnk Dep	Cen Bnk Dep	Cen Bnk Dep
Notional Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	32,000	As below

Pricing and Matching Process
Minimize consideration payment under an EV/CE regime

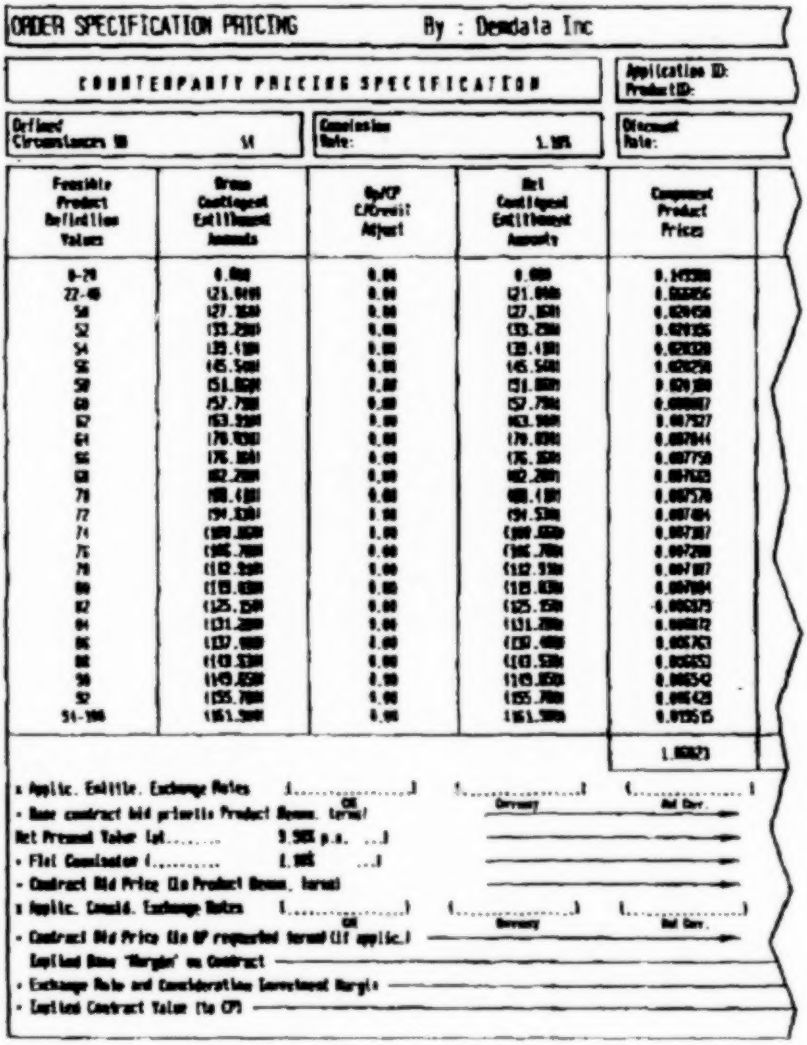
SPECIAL
DEAL TYPE: Not Applicable

Partial Matches desired? No
Manual Approval of Matches desired? No
Desired degree of trading transparency (if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-3-502026-617034-1(and 2)
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01 00 00 00
Desired Max. time for counterparty manual order approval(if applic.): Not Applicable

Preferred/Preferential Dealing:
Not Applicable

Unacceptable Counterparties and Other Stakeholders
Not Applicable

FIG. 46A



ORDER SPECIFICATION PRICING By : Demdata Inc

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID 51

Commission Rate: 1.10%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
0-20	0.000	0.00	0.000	0.145300
22-48	(21.0000)	0.00	(21.000)	0.022056
50	(27.3600)	0.00	(27.360)	0.020450
52	(33.2900)	0.00	(33.290)	0.020335
54	(39.4100)	0.00	(39.410)	0.020320
56	(45.5000)	0.00	(45.500)	0.020250
58	(51.6000)	0.00	(51.600)	0.020100
60	(57.7900)	0.00	(57.790)	0.008007
62	(63.9900)	0.00	(63.900)	0.007527
64	(70.0300)	0.00	(70.030)	0.007044
66	(76.1600)	0.00	(76.160)	0.007750
68	(82.2800)	0.00	(82.280)	0.007635
70	(88.4100)	0.00	(88.410)	0.007570
72	(94.5300)	0.00	(94.530)	0.007404
74	(100.6500)	0.00	(100.650)	0.007307
76	(106.7800)	0.00	(106.780)	0.007200
78	(112.9100)	0.00	(112.910)	0.007107
80	(119.0300)	0.00	(119.030)	0.007004
82	(125.1500)	0.00	(125.150)	-0.006375
84	(131.2800)	0.00	(131.280)	0.006072
86	(137.4000)	0.00	(137.400)	0.005763
88	(143.5300)	0.00	(143.530)	0.005653
90	(149.6500)	0.00	(149.650)	0.006542
92	(155.7800)	0.00	(155.780)	0.006429
94-100	(161.9000)	0.00	(161.900)	0.015515
				1.00023

x Applic. Entitle. Exchange Rates (..................) (..................) (..................)
CCY Currency Ref Ccy.
= Base contract bid price(in Product Denom. terms)
Net Present Value (at........ 9.50% p.a. ...)
= Flat Commission (.......... 1.10% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (..................) (..................) (..................)
CCY Currency Ref Ccy.
= Contract Bid Price (in CP requested terms)(if applic.)
Implied Base 'Margin' on Contract
= Exchange Rate and Consideration Investment Margin
= Implied Contract Value (to CP)

FIG. 46B

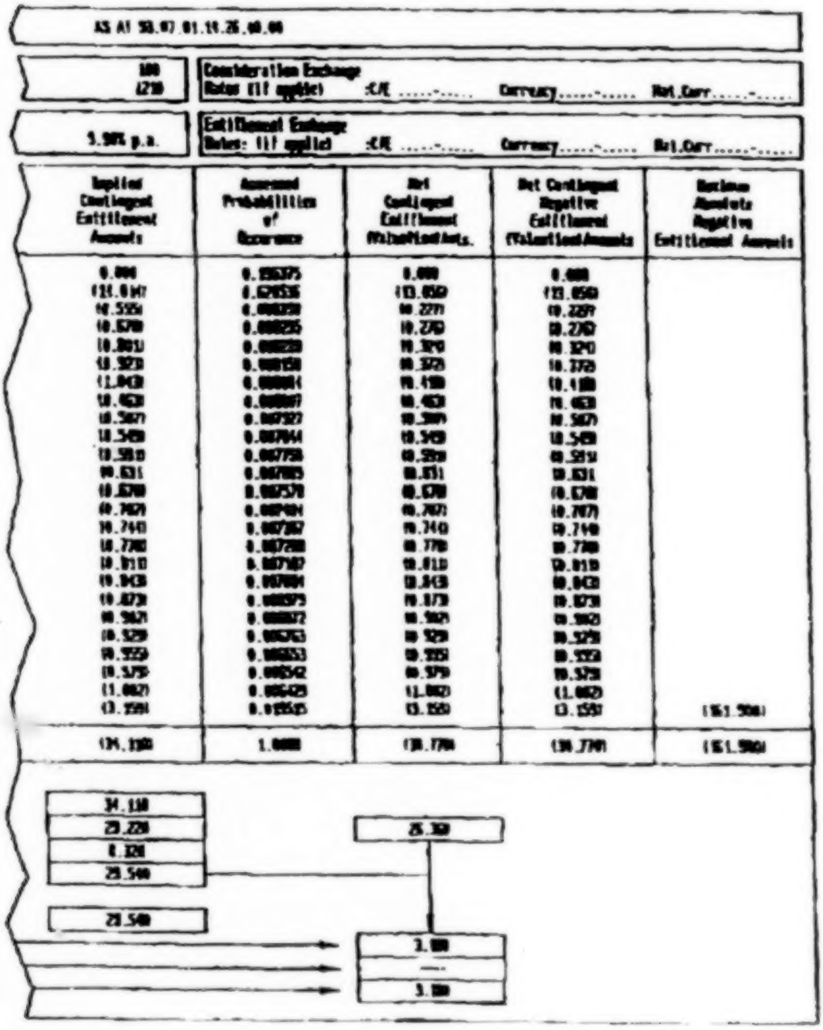
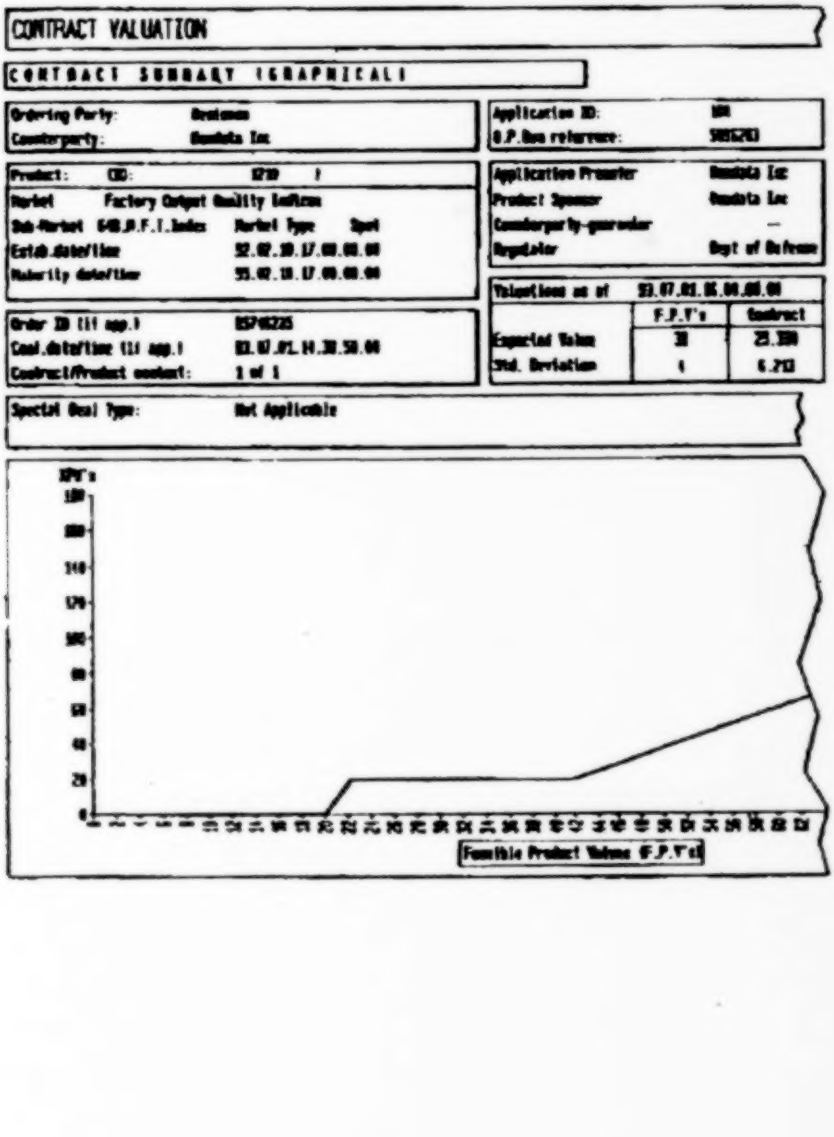

Consideration Exchange
Rates (if applicable)
:C/E
Currency
Net.Curr
Entitlement Exchange
Rates: (if applicable)
:C/E
Currency
Net.Curr
Implied Contingent Entitlement Amounts
Assessed Probabilities of Occurrence
Net Contingent Entitlement (Valuation) Amts.
Net Contingent Negative Entitlement (Valuation) Amounts
Maximum Absolute Negative Entitlement Amounts
0.000
1.0000
34.110

FIG. 47A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: [illegible]
Counterparty: [illegible] Inc

Product: CDD: [illegible]
Market Factory Output Quality Indices
Sub-Market 640.Q.F.I.Index Market Type Spot
Estab.date/time 92.07.10.17.00.00.00
Maturity date/time 95.07.10.17.00.00.00

Order ID (if app.) [illegible]
Cond.date/time (if app.) 93.07.01.14.30.50.00
Contract/Product content: 1 of 1

Application ID: [illegible]
O.P.Doc reference: [illegible]

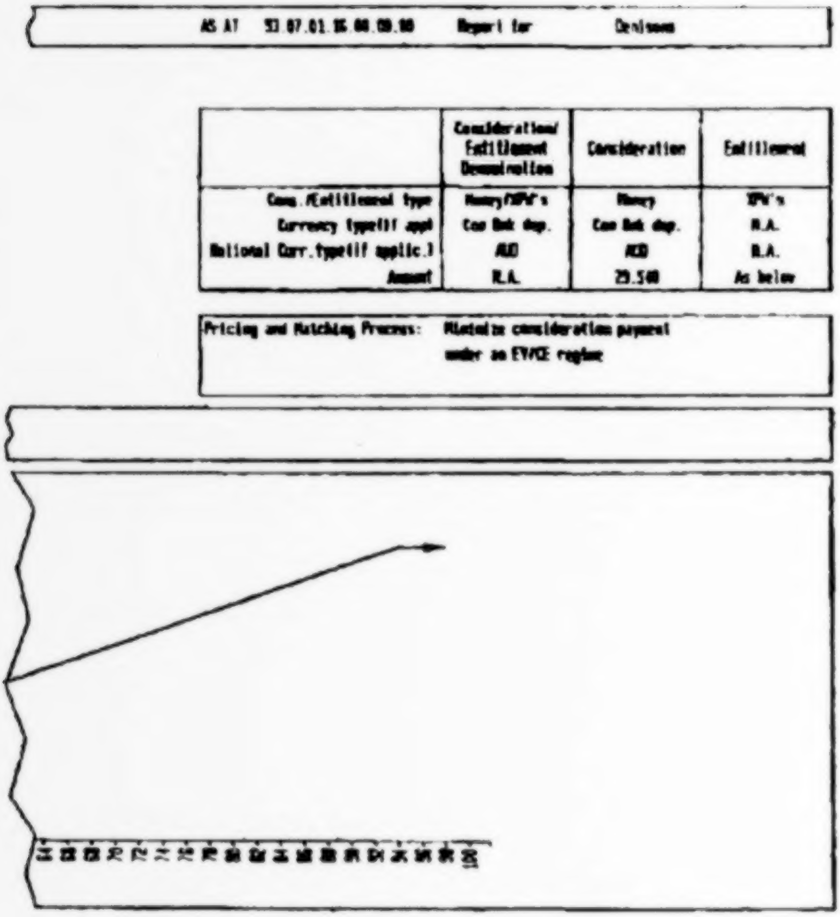
Application Promoter [illegible] Inc
Product Sponsor [illegible] Inc
Counterparty-guarantor —
Regulator Dept of Defense

Valuations as of 93.07.01.16.00.00.00

	F.P.V's	Contract
Expected Value	33	25.330
Std. Deviation	4	6.213

Special Deal Type: Not Applicable

FIG. 47B

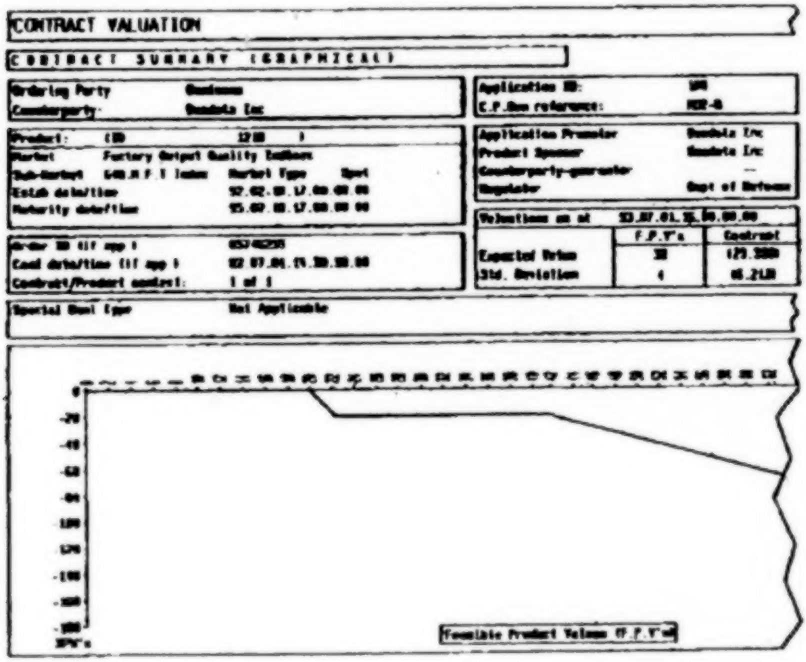


AS AT 53.07.01.16.00.09.00 Report for Denison

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/SPV's	Money	SPV's
Currency type(if appl	Cen Bnk dep.	Cen Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	29.500	As below

Pricing and Matching Process: Minimize consideration payment
under an EV/CE regime

FIG. 48A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party [illegible]
Counterparty: [illegible] Inc

Product: (ID 12[illegible])
Market Factory Output Quality Indices
Sub-Market [illegible] Index Market Type Spot
Estab date/time 97.02.[illegible].17.00.00.00
Maturity date/time 95.07.[illegible].17.00.00.00

Order ID (if app) [illegible]
Cond date/time (if app) [illegible]
Contract/Product control: 1 of 1

Special Deal type Not Applicable

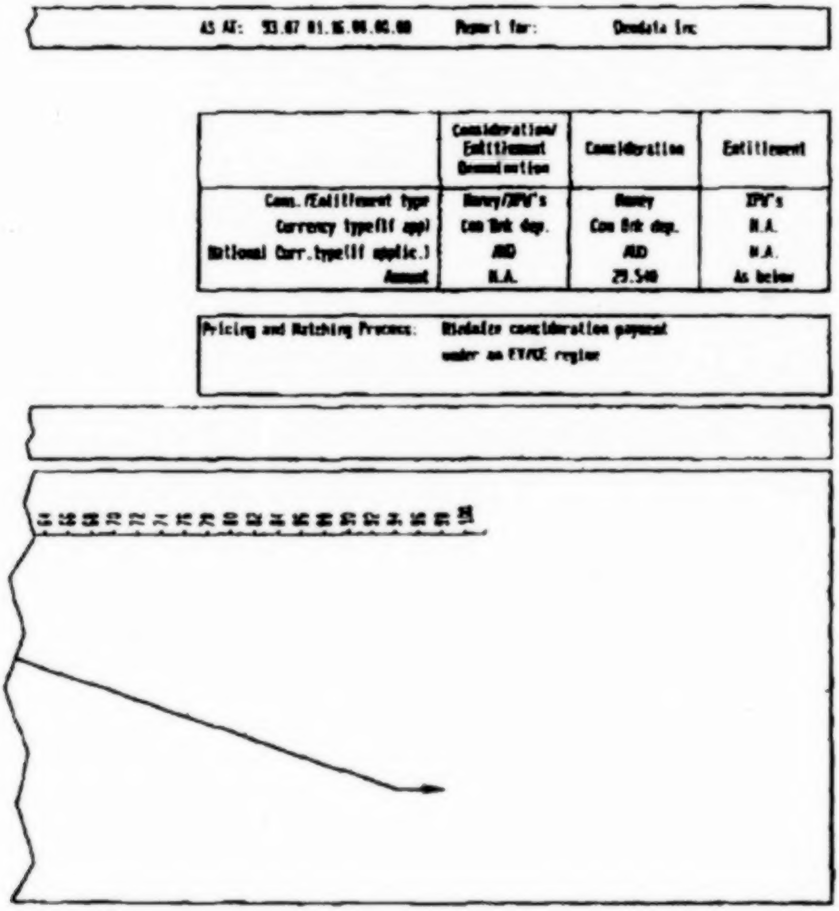
Application ID: [illegible]
C.P.Dom reference: [illegible]

Application Promoter [illegible] Inc
Product Sponsor [illegible] Inc
Counterparty-guarantor —
Regulator Dept of Defense

Valuations as at [illegible]

	F.P.V's	Contract
Expected Value	[illegible]	[illegible]
Std. Deviation	4	[illegible]

FIG. 48B

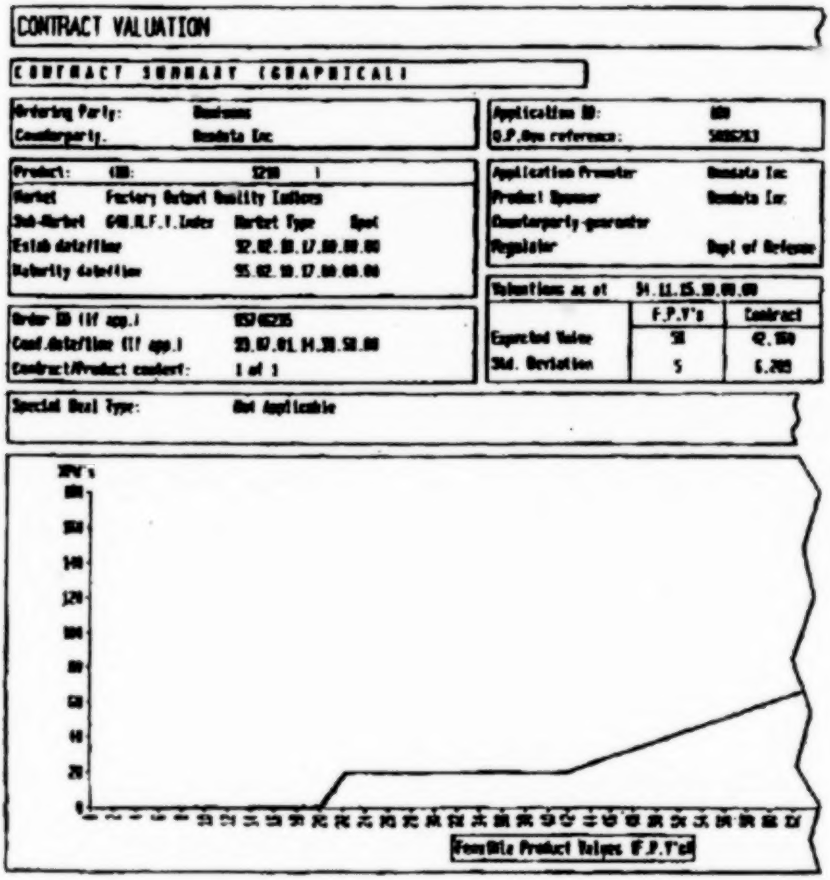


AS AT: 93.07 01.16.00.00.00 Report for: Dendata Inc

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/IPV's	Money	IPV's
Currency type(if app)	Com Bnk dep.	Com Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	29.540	As below

Pricing and Matching Process: Minimize consideration payment under an EY/CE regime

FIG. 49A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	[illegible]
Counterparty:	[illegible] Inc

Application ID:	[illegible]
O.P.Ops reference:	[illegible]

Product: (ID: 5210)

Market	Factory Output Quality Indices		
Sub-Market	640.Q.F.I.Index	Market Type	Spot
Estab date/time		92.02.10.17.00.00.00	
Maturity date/time		95.02.10.17.00.00.00	

Application Promoter	[illegible] Inc
Product Sponsor	[illegible] Inc
Counterparty-guarantor	
Regulator	Dept of Defense

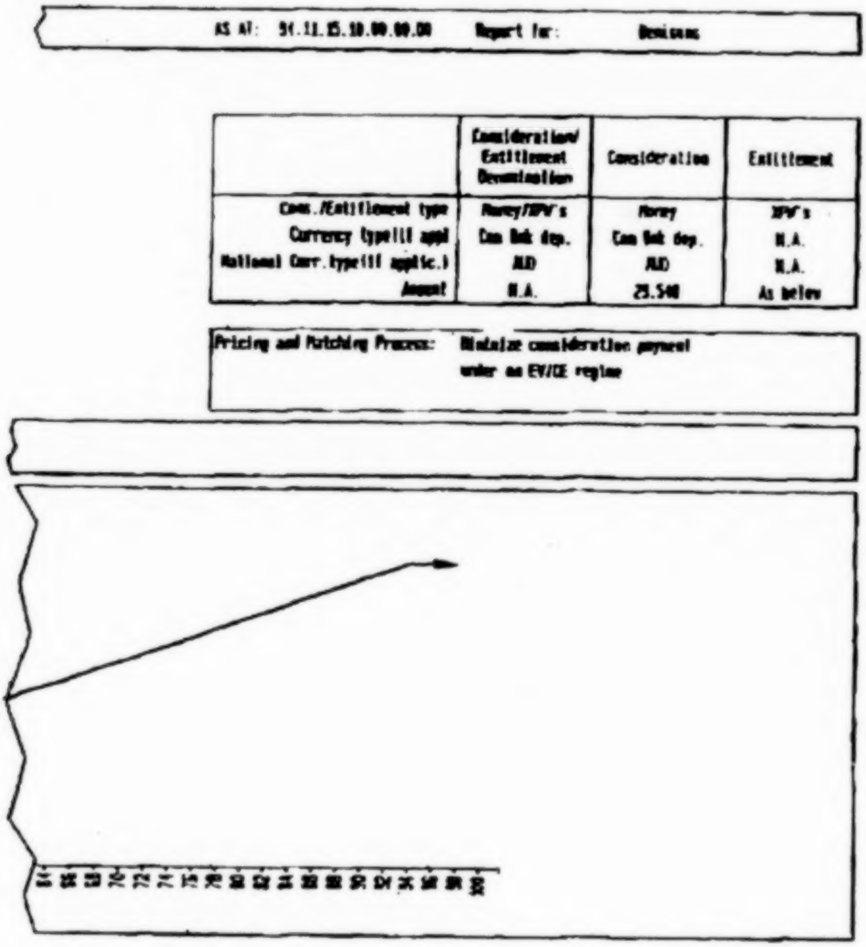
Order ID (If app.)	9570235
Conf.date/time (If app.)	93.07.01.14.30.50.00
Contract/Product content:	1 of 1

Valuations as at 94.11.15.10.00.00

	F.P.V's	Contract
Expected Value	58	42.150
Std. Deviation	5	6.203

Special Deal Type: Not Applicable

FIG. 49B

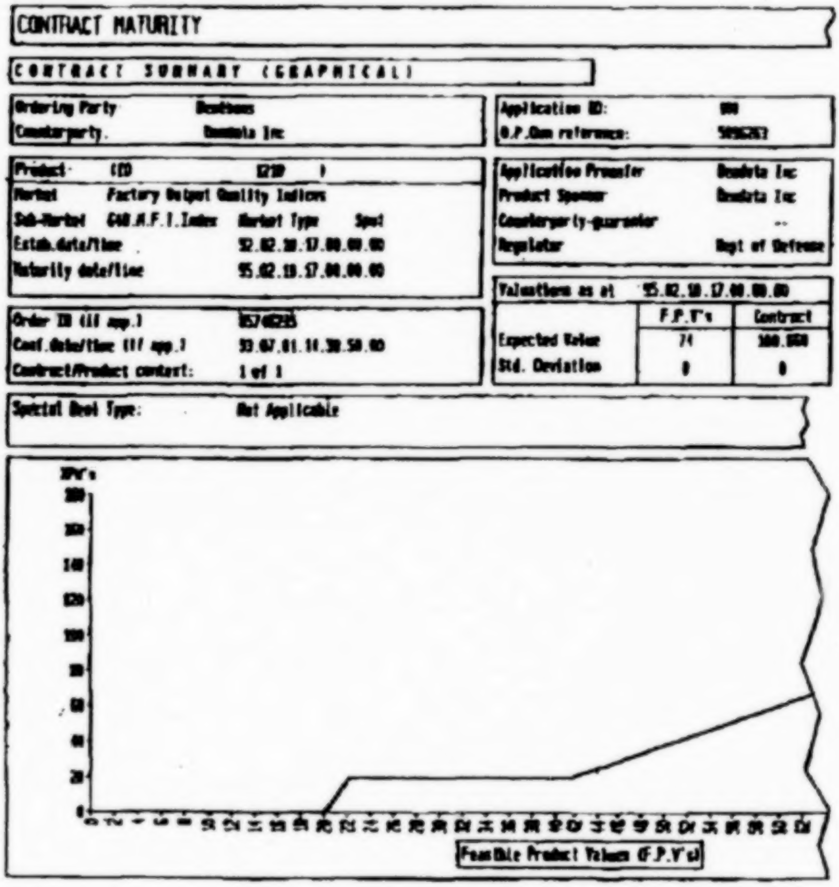


AS AT: 91.11.15.10.00.00.00 Report for: Denisons

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/IPV's	Money	IPV's
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	25.540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

FIG. 50A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party [illegible]
Counterparty. Dendata Inc

Application ID: 000
O.P.Dom reference: 5096253

Product: (CD 1210)
Market Factory Output Quality Indices
Sub-Market GAO.A.F.I.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Application Promoter Dendata Inc
Product Sponsor Dendata Inc
Counterparty-guarantor --
Regulator Dept of Defense

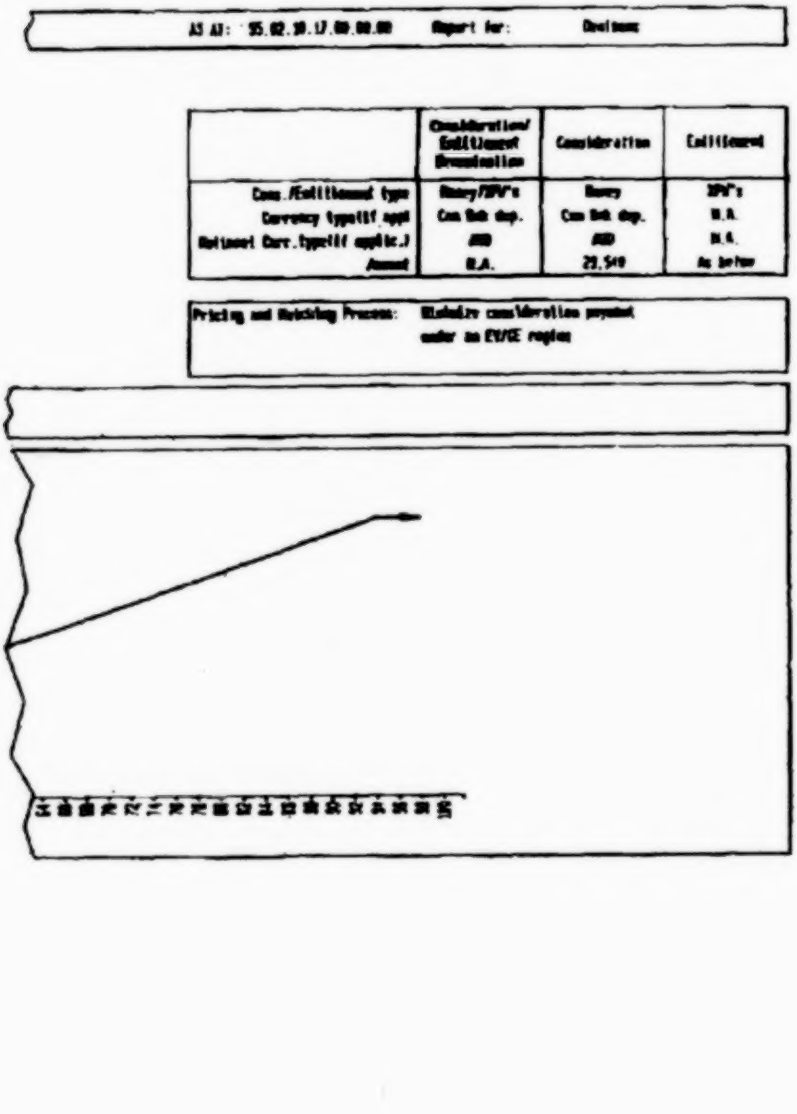
Order ID (if app.) 15740235
Conf.date/time (if app.) 93.07.01.14.30.50.00
Contract/Product context: 1 of 1

Valuations as at 95.02.10.17.00.00.00

	F.P.V's	Contract
Expected Value	74	100.000
Std. Deviation	0	0

Special Deal Type: Not Applicable

FIG. 50B

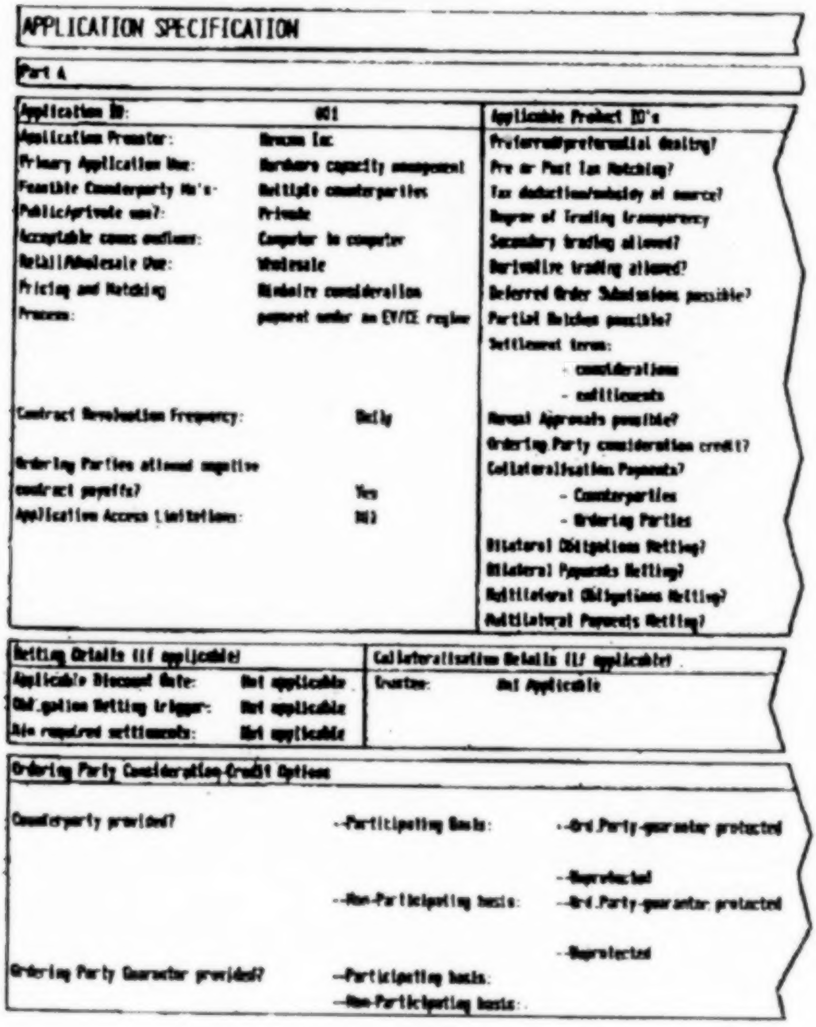


AS AT: 95.02.10.17.00.00.00 Report for: Dealer

	Consideration/ Entitlement Breakdown	Consideration	Entitlement
Cons./Entitlement type	Money/SPV's	Money	SPV's
Currency type(if appl	Can Bnk dep.	Can Bnk dep.	N.A.
Notional Curr.type(if applic.)	USD	USD	N.A.
Amount	N.A.	23,540	As below

Pricing and Matching Process: Globalize consideration payment under an EV/CE regime

FIG. 51A



APPLICATION SPECIFICATION

Part A

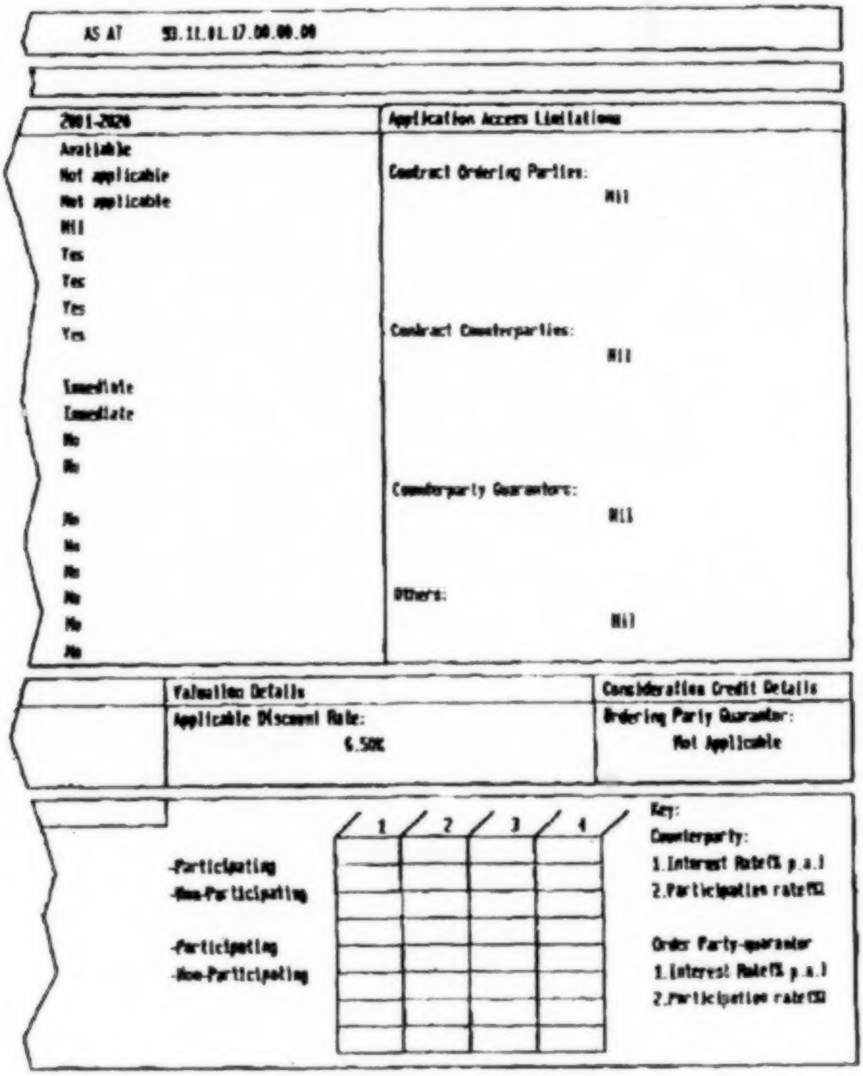
Application ID:	001	Applicable Product ID's
Application Promoter:	Brazen Inc	Preferred/preferential dealing?
Primary Application Use:	Hardware capacity management	Pre or Post Tax Matching?
Feasible Counterparty No's:	Multiple counterparties	Tax deduction/subsidy at source?
Public/private use?:	Private	Degree of Trading transparency
Acceptable comms medium:	Computer to computer	Secondary trading allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading allowed?
Pricing and Matching	Minimize consideration	Deferred Order Submissions possible?
Process:	payment under an EV/CE regime	Partial Matches possible?
		Settlement terms: - considerations - entitlements
Contract Revaluation Frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit?
Ordering Parties allowed negative contract payoffs?	Yes	Collateralisation Payments? - Counterparties - Ordering Parties
Application Access Limitations:	Nil	Bilateral Obligations Netting?
		Bilateral Payments Netting?
		Multilateral Obligations Netting?
		Multilateral Payments Netting?

Netting Details (if applicable)		Collateralisation Details (if applicable)	
Applicable Discount Rate:	Not applicable	Trustee:	Not Applicable
Obligation Netting trigger:	Not applicable		
Min required settlements:	Not applicable		

Ordering Party Consideration Credit Options

Counterparty provided?	--Participating Basis:	--3rd Party-guarantor protected
		--Unprotected
	--Non-Participating basis:	--3rd Party-guarantor protected
		--Unprotected
Ordering Party Guarantor provided?	--Participating basis:	
	--Non-Participating basis:	

FIG. 51B



AS AT 53.11.01.17.00.00.00

2001-2020

Available
Not applicable
Not applicable
Nil
Yes
Yes
Yes
Yes

Immediate
Immediate
No
No

No
No
No
No
No
No

Application Access Limitations

Contract Ordering Parties:
Nil

Contract Counterparties:
Nil

Counterparty Guarantors:
Nil

Others:
Nil

Valuation Details

Applicable Discount Rate:
6.50%

Consideration Credit Details

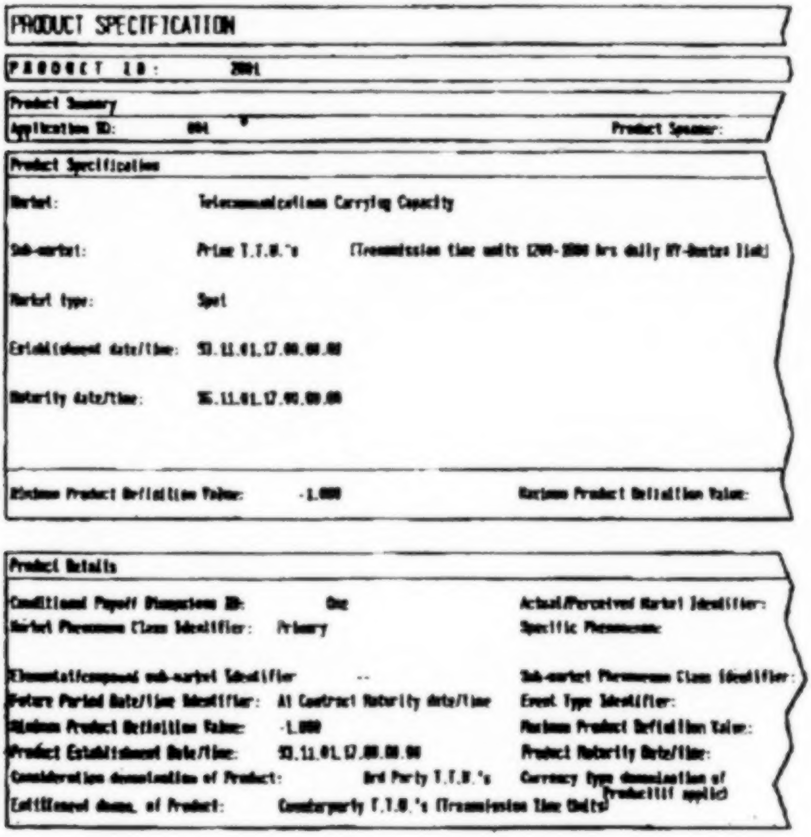
Ordering Party Guarantor:
Not Applicable

	1	2	3	4
-Participating				
-Non-Participating				
-Participating				
-Non-Participating				

Key:
Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Order Party-guarantor
1.Interest Rate(% p.a.)
2.Participation rate(%)

FIG. 52A



PRODUCT SPECIFICATION

PRODUCT ID: 2001

Product Summary

Application ID: 004

Product Sponsor:

Product Specification

Market: Telecommunications Carrying Capacity

Sub-market: Prime T.T.U.'s (Transmission time units 1200-1800 hrs daily NY-Boston link)

Market type: Spot

Establishment date/time: 93.11.01.17.00.00.00

Maturity date/time: 95.11.01.17.00.00.00

Minimum Product Definition Value: -1.000

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Actual/Perceived Market Identifier:

Market Phenomena Class Identifier: Primary

Specific Phenomenon:

Elemental/compound sub-market Identifier --

Sub-market Phenomenon Class Identifier:

Future Period Date/time Identifier: At Contract Maturity date/time

Event Type Identifier:

Minimum Product Definition Value: -1.000

Maximum Product Definition Value:

Product Establishment Date/time: 93.11.01.17.00.00.00

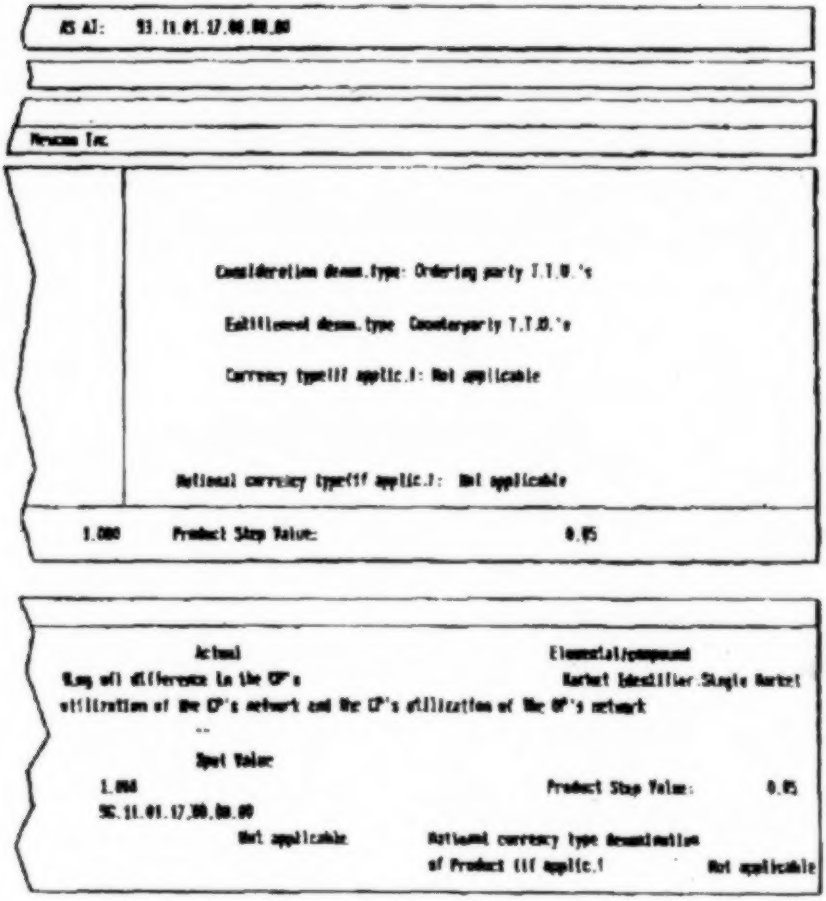
Product Maturity Date/time:

Consideration denomination of Product: 3rd Party T.T.U.'s

Currency type denomination of Product(if applic)

Entitlement denom. of Product: Counterparty T.T.U.'s (Transmission Time Units)

FIG. 52B



AS AT: 93.11.01.17.00.00.00

Nexcom Inc

Consideration denom. type: Ordering party T.T.U.'s

Entitlement denom. type Counterparty T.T.U.'s

Currency type(if applic.): Not applicable

Notional currency type(if applic.): Not applicable

1.000 Product Step Value: 0.05

Actual

Elemental/compound

Swap of difference in the OP's

Market Identifier:Single Market

utilization of the CP's network and the CP's utilization of the OP's network

--

Spot Value

1.000

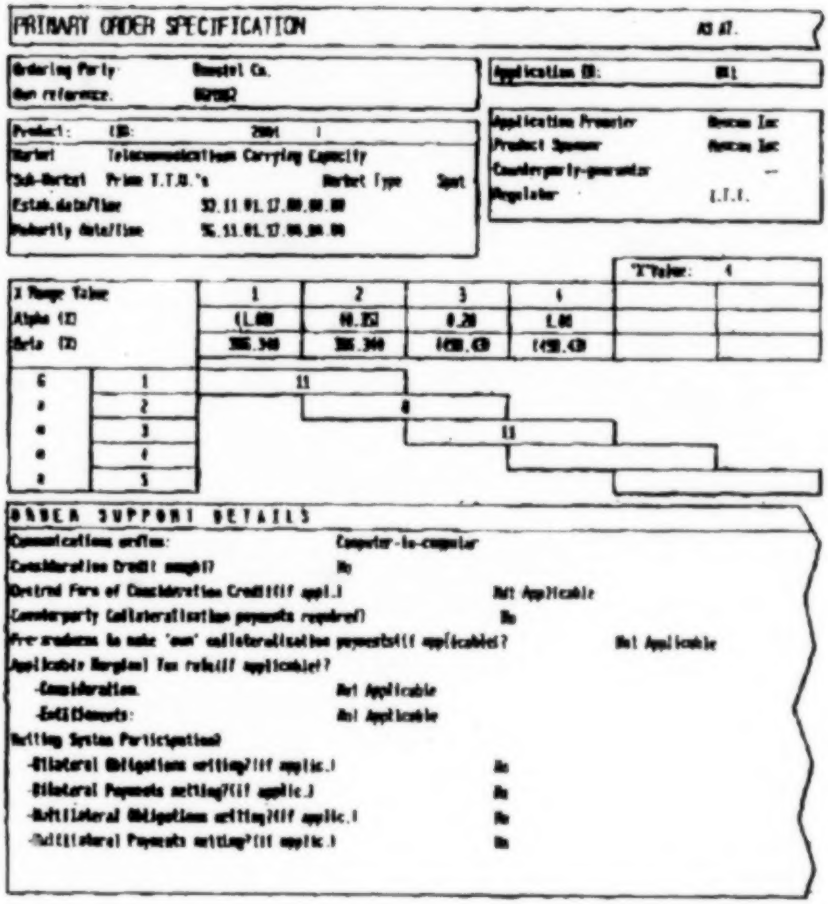
Product Step Value: 0.05

93.11.01.17.00.00.00

Not applicable

Notional currency type denomination of Product (if applic.) Not applicable

FIG. 53A



PRIMARY ORDER SPECIFICATION AS AT.

Ordering Party: [illegible] Co.
Own reference: [illegible]

Application ID: 001

Product: ID: 2001 1
Market Telecommunications Carrying Capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 30.11.01.17.00.00.00
Maturity date/time 31.11.01.17.00.00.00

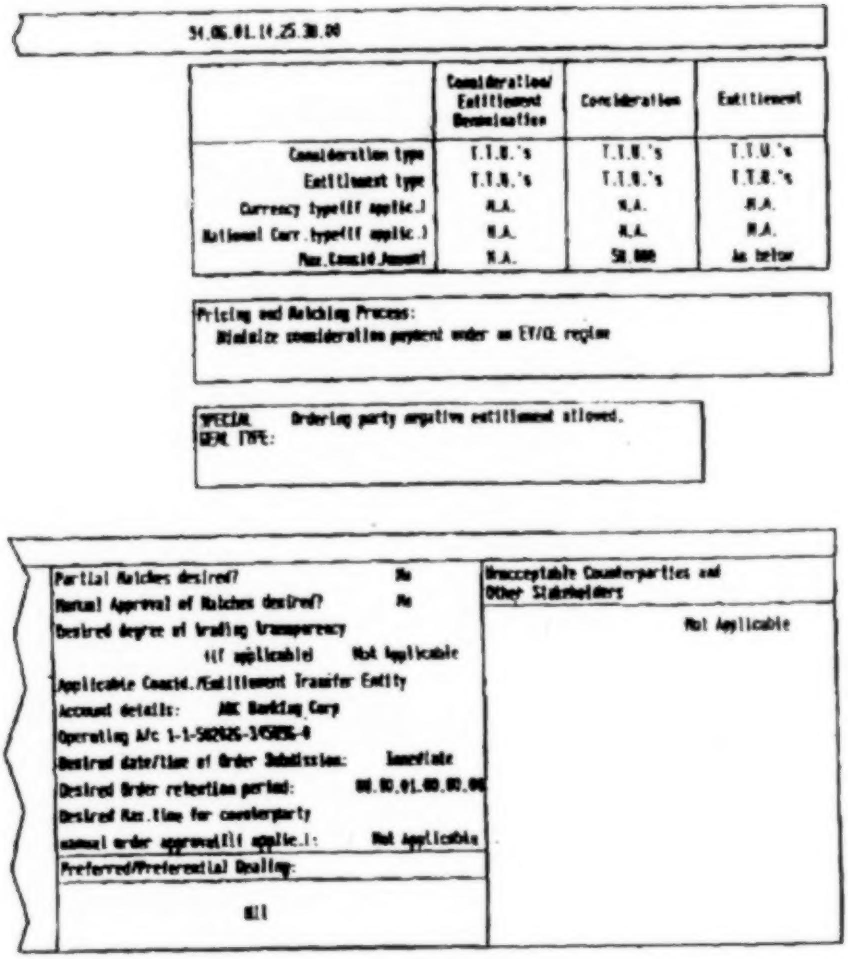
Application Promoter [illegible] Inc
Product Sponsor [illegible] Inc
Counterparty-guarantor —
Regulator I.T.I.

"X" Value: 4

X Range Value		1	2	3	4		
Alpha (X)		11.00	40.35	0.20	1.00		
Beta (X)		385.340	385.340	1450.43	1450.43		
G	1	11					
a	2		8				
m	3			11			
m	4						
a	5						

ORDER SUPPORT DETAILS
Communications orflow: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? No
Pre-arrangements to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration. Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 53B



54.06.01.14.25.30.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Consideration type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if applic.)	N.A.	N.A.	N.A.
National Curr. type(if applic.)	N.A.	N.A.	N.A.
Max.Consid.Amount	N.A.	50.000	As below

Pricing and Matching Process:
Minimize consideration payment under an EY/CL regime

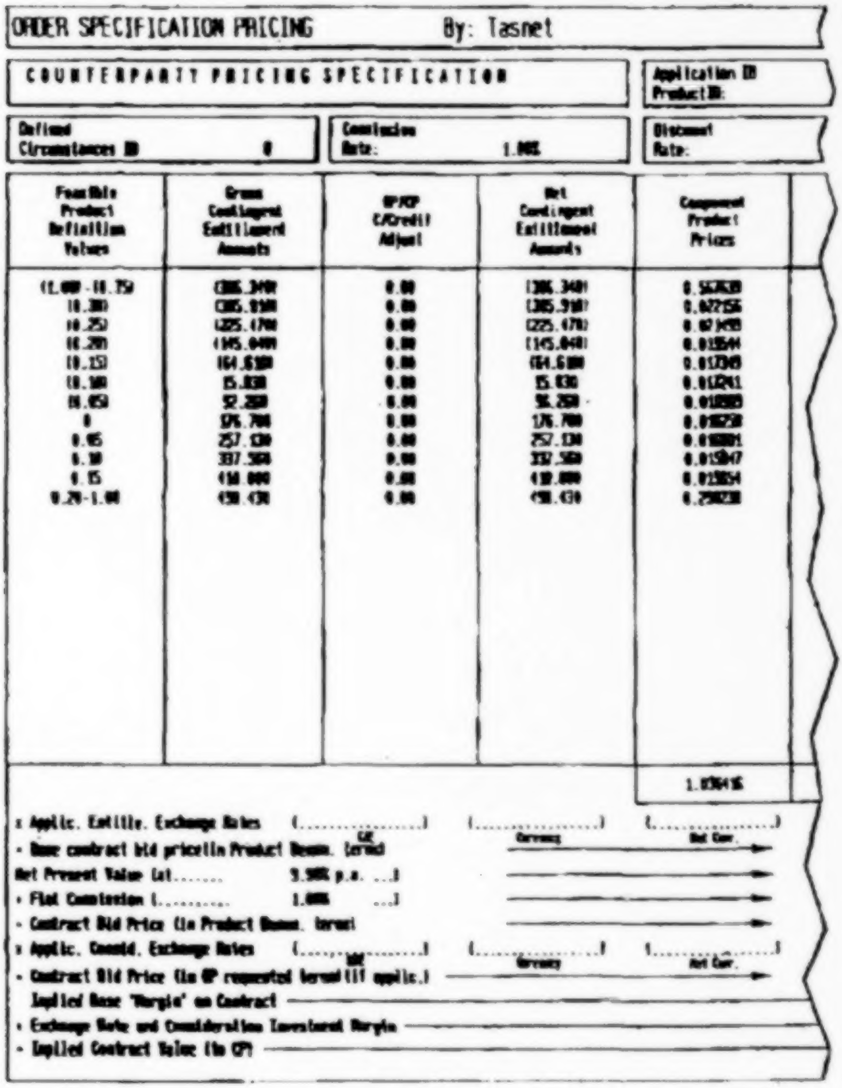
SPECIAL Ordering party negative entitlement allowed.
GENL TYPE:

Partial Matches desired? No
Manual Approval of Matches desired? No
Desired degree of trading transparency
(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-502026-345056-0
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty
manual order approval(if applic.): Not Applicable

Preferred/Preferential Dealing:
Nil

Unacceptable Counterparties and Other Stakeholders
Not Applicable

FIG. 54A



ORDER SPECIFICATION PRICING By: Tasnet

COUNTERPARTY PRICING SPECIFICATION

Application ID
Product ID:

Defined Circumstances ID 0

Commission Rate: 1.00%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	OP/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
(1.00-(0.75)	(306.340)	0.00	(306.340)	0.567630
(0.30)	(305.910)	0.00	(305.910)	0.027156
(0.25)	(225.170)	0.00	(225.170)	0.071498
(0.20)	(145.040)	0.00	(145.040)	0.015544
(0.15)	(64.610)	0.00	(64.610)	0.017349
(0.10)	15.830	0.00	15.830	0.017241
(0.05)	92.280	0.00	96.280	0.018085
0	176.700	0.00	176.700	0.018258
0.05	257.130	0.00	257.130	0.018001
0.10	337.560	0.00	332.560	0.015847
0.15	410.000	0.00	410.000	0.015054
0.20-1.00	450.430	0.00	450.430	0.250238
				1.036416

x Applic. Entitle. Exchange Rates (....................) (....................) (....................)
= Base contract bid price(in Product Denom. terms) GE Currency Bid Cur.
Net Present Value (at........ 9.50% p.a. ...)
+ Flat Commission (........... 1.00% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Considerat. Exchange Rates (....................) (....................) (....................)
= Contract Bid Price (in OP requested terms)(if applic.) GE Currency Bid Cur.
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (in CP)

FIG. 54B

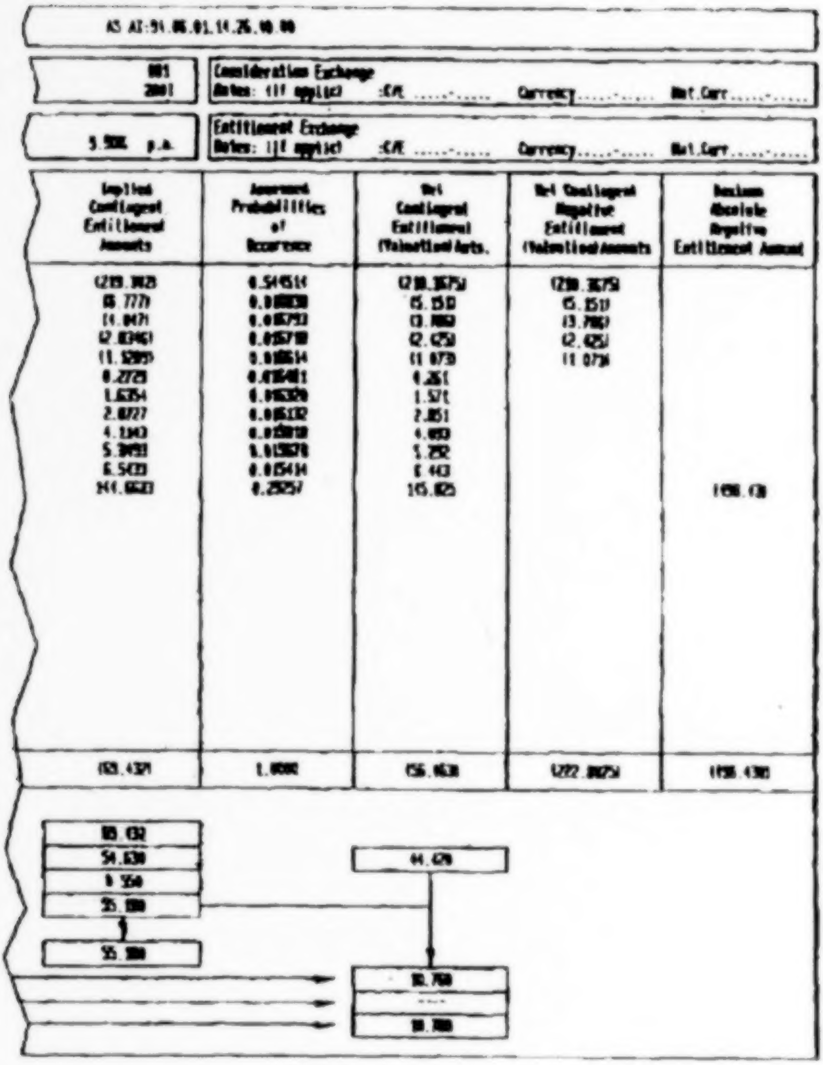
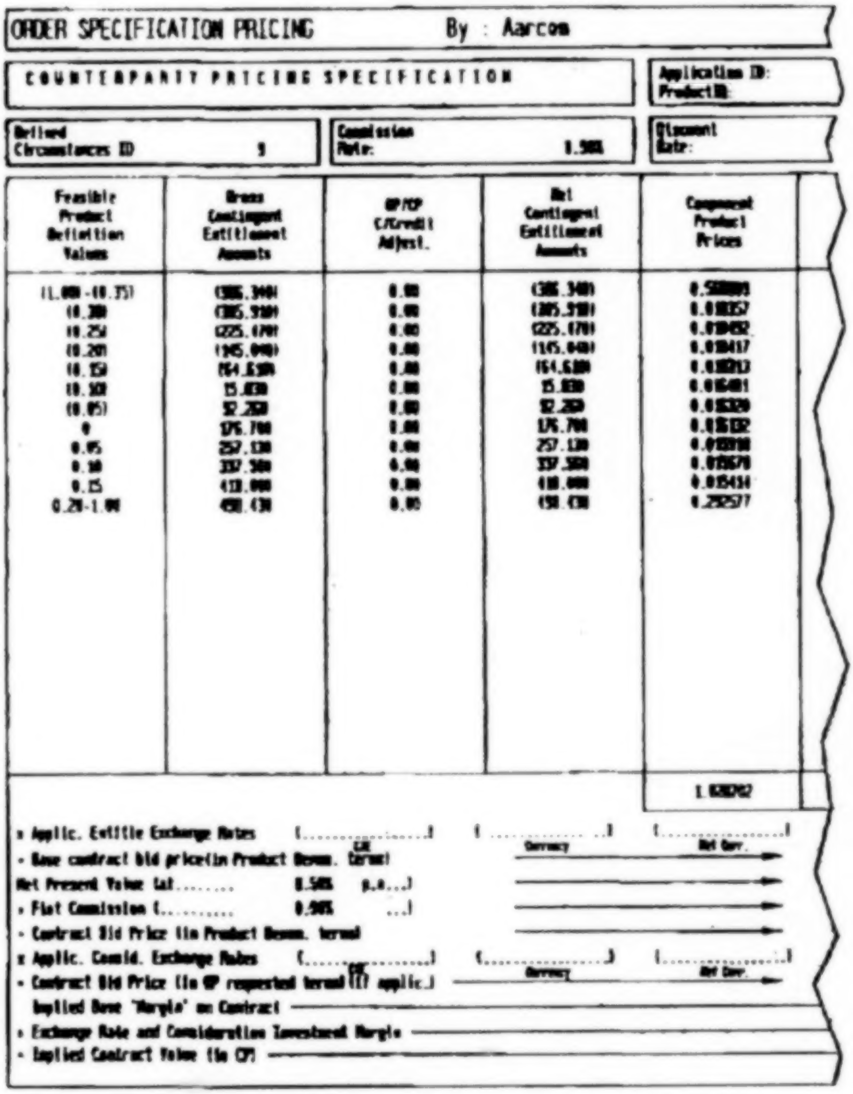

AS AT:
Consideration Exchange
Rates: (if applic)
:C/E
Currency
Nat.Curr
Entitlement Exchange
Rates: (if applic)
:C/E
Currency
Nat.Curr
p.a.
Implied Contingent Entitlement Amounts
Assessed Probabilities of Occurrence
Net Contingent Entitlement (Valuation) Amts.
Net Contingent Negative Entitlement (Valuation) Amounts
Maximum Absolute Negative Entitlement Amount
1.0000

FIG. 55A



ORDER SPECIFICATION PRICING By : Aarcom

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID 9

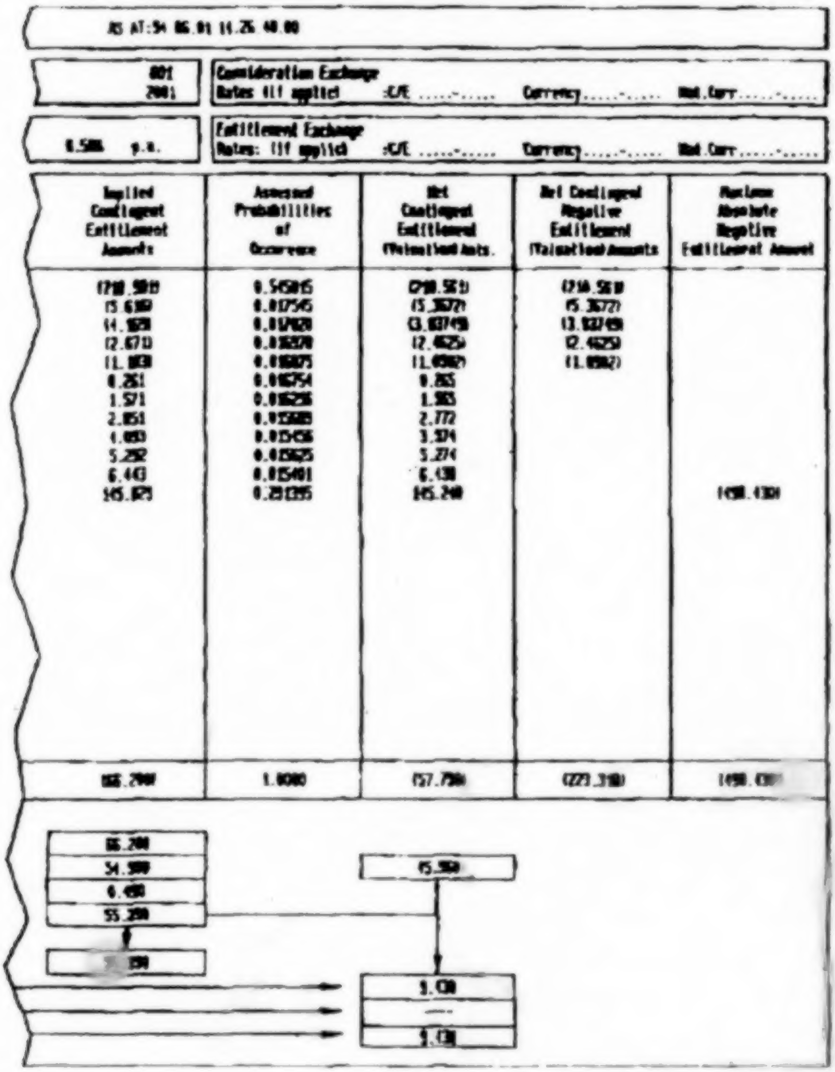
Commission Rate: 1.50%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	OP/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
(1.000-(0.35))	(386.340)	0.00	(386.340)	0.580009
(0.30)	(305.930)	0.00	(305.930)	0.018357
(0.25)	(225.470)	0.00	(225.470)	0.018452
(0.20)	(145.040)	0.00	(145.040)	0.018417
(0.15)	(64.610)	0.00	(64.610)	0.018313
(0.10)	15.830	0.00	15.830	0.016401
(0.05)	96.250	0.00	96.250	0.015329
0	176.700	0.00	176.700	0.015132
0.05	257.130	0.00	257.130	0.015098
0.10	337.560	0.00	337.560	0.015670
0.15	418.000	0.00	418.000	0.015434
0.20-1.00	498.430	0.00	498.430	0.252577
				1.038702

× Applic. Entitle Exchange Rates (..................) (..................) (..................)
- Base contract bid price (in Product Denom. terms) CUR Currency Ref Curr.
Net Present Value (at........ 0.50% p.a...)
+ Flat Commission (.......... 0.50% ...)
- Contract Bid Price (in Product Denom. terms)
× Applic. Consid. Exchange Rates (..................) (..................) (..................)
- Contract Bid Price (in CP requested terms) (if applic.) CUR Currency Ref Curr.
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
- Implied Contract Value (in CP)

FIG. 55B



AS AT: 94 06.01 14.25 40.00

001
2001

Consideration Exchange
Rates (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

0.500 p.a.

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurrence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(710.500)	0.545015	(710.563)	(710.563)	
(5.610)	0.017545	(5.3672)	(5.3672)	
(4.120)	0.017020	(3.03749)	(3.03749)	
(2.671)	0.016370	(2.4625)	(2.4625)	
(1.130)	0.016075	(1.0502)	(1.0502)	
0.261	0.015754	0.265		
1.571	0.015256	1.565		
2.851	0.015585	2.772		
4.093	0.015456	3.574		
5.292	0.015625	5.274		
6.443	0.015401	6.430		
145.875	0.251395	145.240		(458.430)
66.290	1.0000	(57.790)	(223.310)	(458.430)

66.290
54.900
6.490
55.290

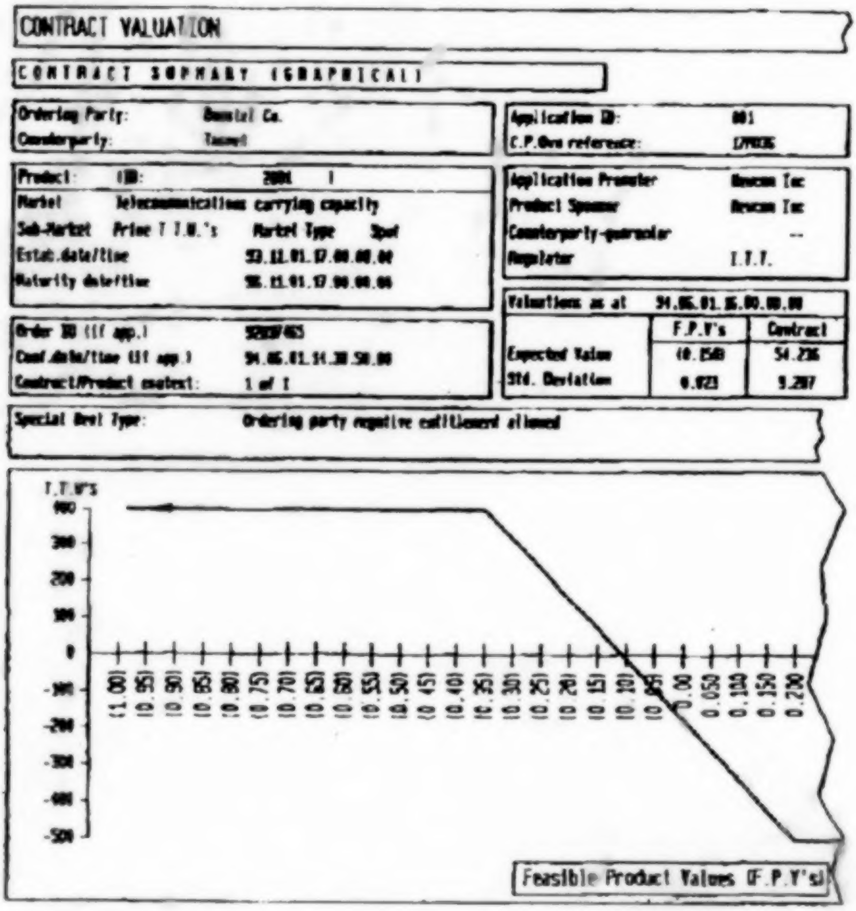
[illegible]

(5.550)

1.130

1.130

FIG. 56A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bountel Co.
Counterparty: Tacomt

Product: (ID: 2001 I
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 93.11.01.17.00.00.00
Maturity date/time 95.11.01.17.00.00.00

Order ID (if app.) 5203/65
Conf.date/time (if app.) 94.05.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 001
C.P.One reference: 17/035

Application Promoter Rescom Inc
Product Sponsor Rescom Inc
Counterparty-guarantor --
Regulator I.T.T.

Valuations as at 94.05.01.15.00.00.00

	F.P.V's	Contract
Expected Value	(0.150)	54.236
Std. Deviation	0.023	9.287

Special Deal Type: Ordering party negative settlement allowed

T.T.U'S
400
300
200
100
0
-100
-200
-300
-400
-500
(1.00)
(0.95)
(0.90)
(0.85)
(0.80)
(0.75)
(0.70)
(0.65)
(0.60)
(0.55)
(0.50)
(0.45)
(0.40)
(0.35)
(0.30)
(0.25)
(0.20)
(0.15)
(0.10)
(0.05)
0.00
0.050
0.100
0.150
0.200
Feasible Product Values (F.P.V's)

FIG. 56B

AS AT 94.06.01.16.00.00.00 Report for: Basstel Co

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,100	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

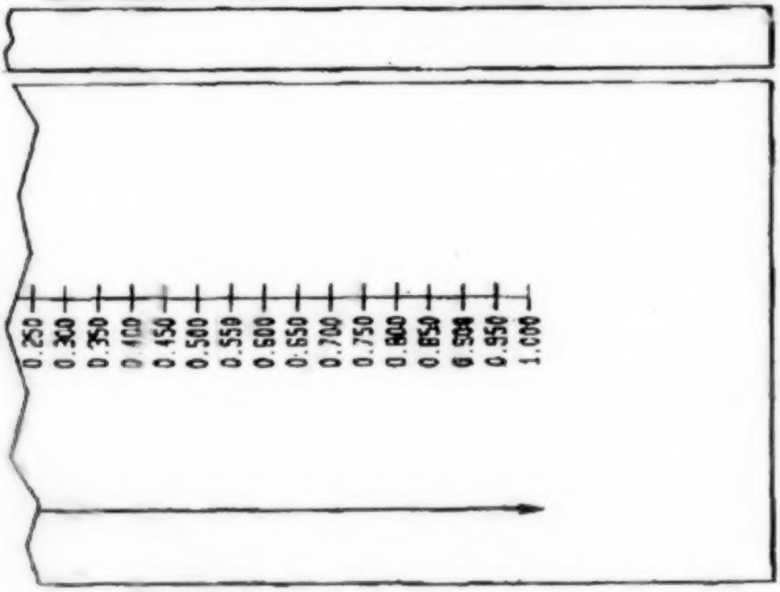
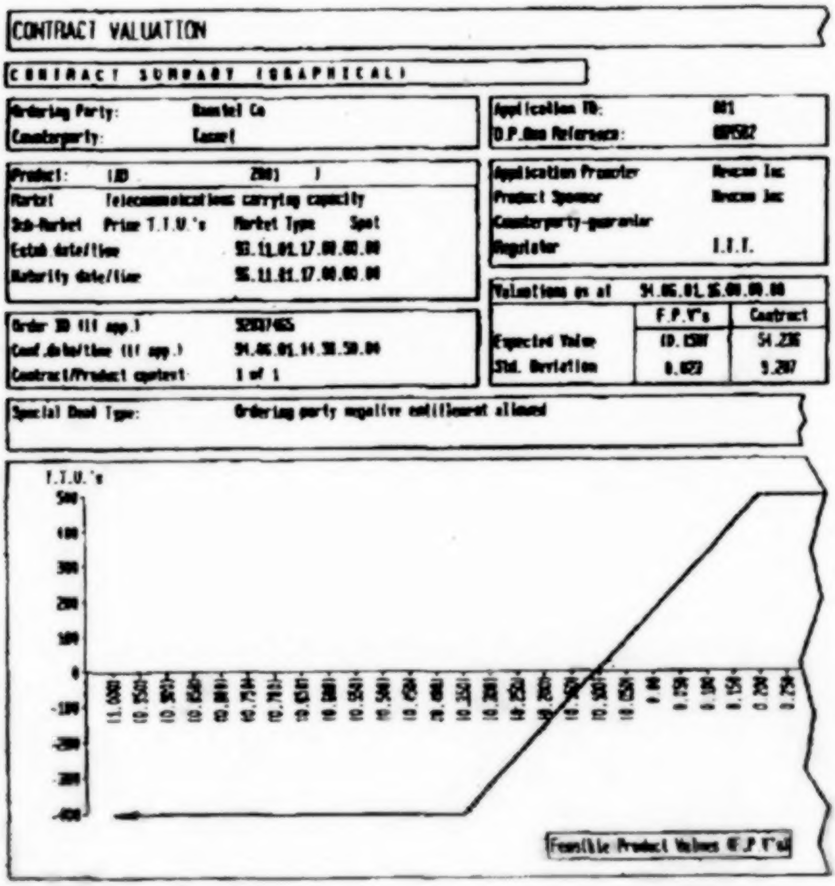

0.250
0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 57A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bamtel Co
Counterparty: Lasert

Application ID: 001
D.P.Ann Reference: 00P502

Product: (ID 2001)
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab date/time 93.11.01.17.00.00.00
Maturity date/time 95.11.01.17.00.00.00

Application Promoter Nexcom Inc
Product Sponsor Nexcom Inc
Counterparty-guarantor
Regulator I.T.T.

Order ID (if app.) 52037465
Conf.date/time (if app.) 94.06.01.14.38.50.00
Contract/Product context 1 of 1

Valuations as at 94.06.01.15.00.00.00

	F.P.V's	Contract
Expected Value	10.1597	54.236
Std. Deviation	0.023	9.287

Special Deal Type: Ordering party negative entitlement allowed

FIG. 57B

AS AT 94.06.01 05.00.00.00 Report for: Tasnet

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl)	N.A.	N.A.	N.A.
Notional Curr.type(if applic.)	N.A	N.A	N.A
Amount	N.A.	55,100	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

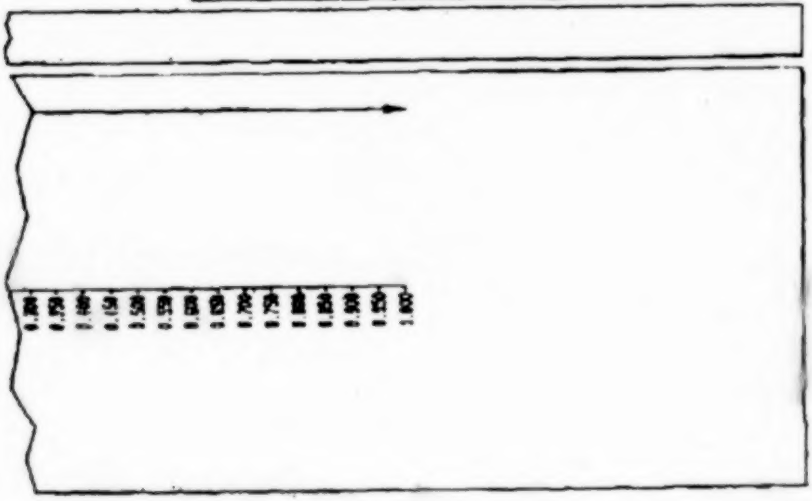
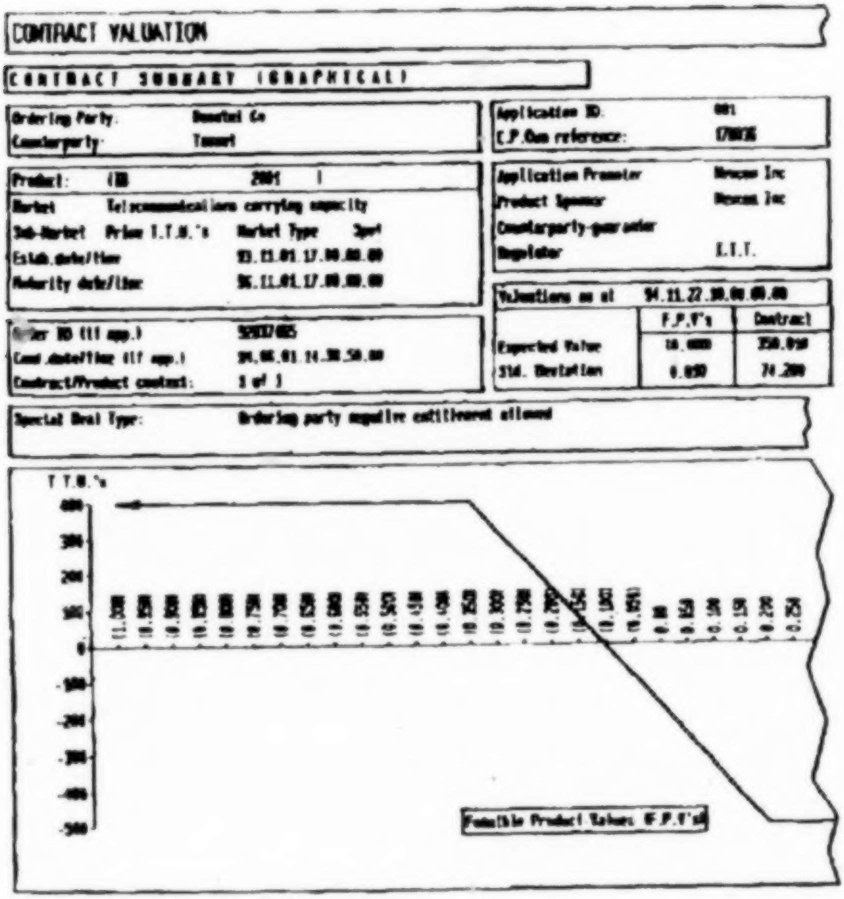

0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 58A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bantel Co
Counterparty: Tassot

Application ID: 001
C.P.Own reference: 170036

Product: [illegible] 2001 1
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab. date/time 93.11.01.17.00.00.00
Maturity date/time 96.11.01.17.00.00.00

Application Promoter Nexcom Inc
Product Sponsor Nexcom Inc
Counterparty-guarantor
Regulator L.I.T.

Order ID (if app.) 52037605
Cond. date/time (if app.) 94.06.01.14.38.50.00
Contract/Product context: 1 of 1

Valuations as at 94.11.22.10.00.00.00

	P.P.V's	Contract
Expected Value	10.000	350.050
Std. Deviation	0.050	74.200

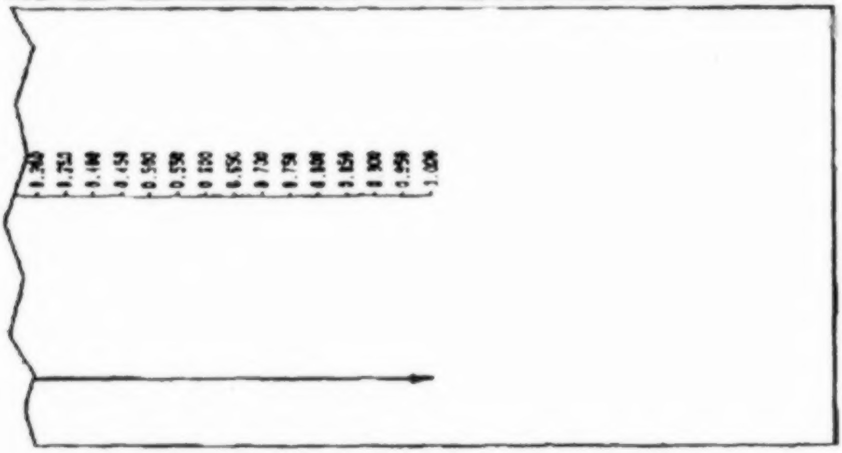
Special Deal Type: Ordering party negative entitlement allowed

FIG. 58B

AS AT 94.11.22.10.00.00.00 Report for: Rentel Co

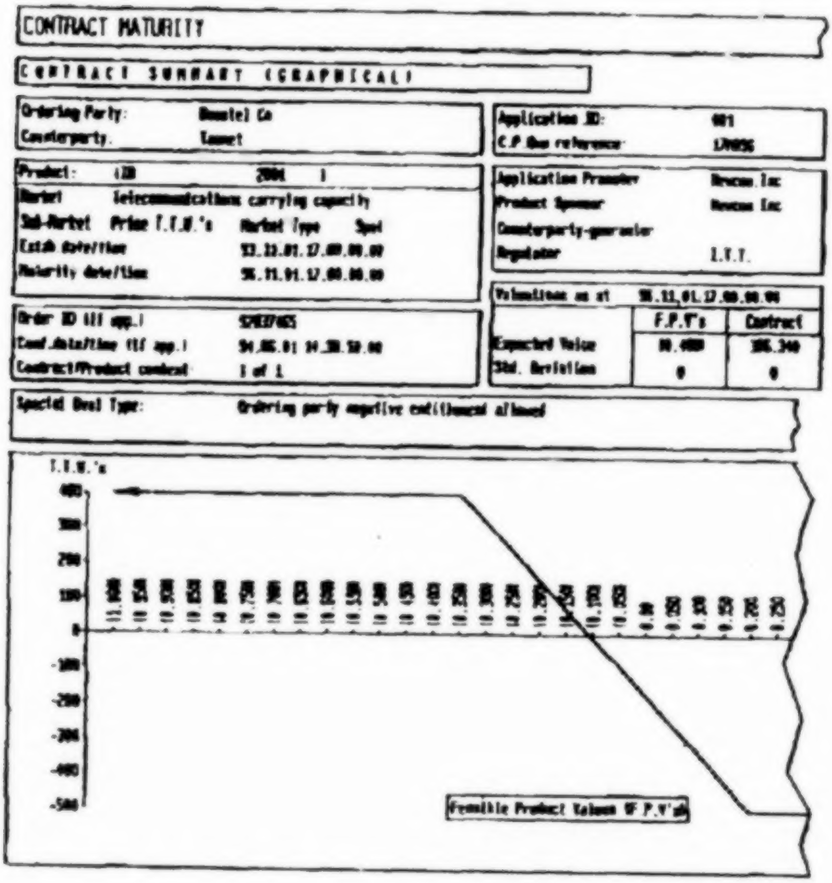
	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.O.'s	T.T.O.'s	T.T.O.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,000	As below

Pricing and Matching Process: Windable consideration payment under an EV/CE regime



0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 59A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bountel Co
Counterparty: Tamet

Application ID: 001
C.P. Own reference: 179856

Product: CID 2004 1
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab date/time 93.11.01.17.00.00.00
Maturity date/time 95.11.01.17.00.00.00

Application Promoter Hexcon Inc
Product Sponsor Hexcon Inc
Counterparty-guarantor
Regulator I.T.T.

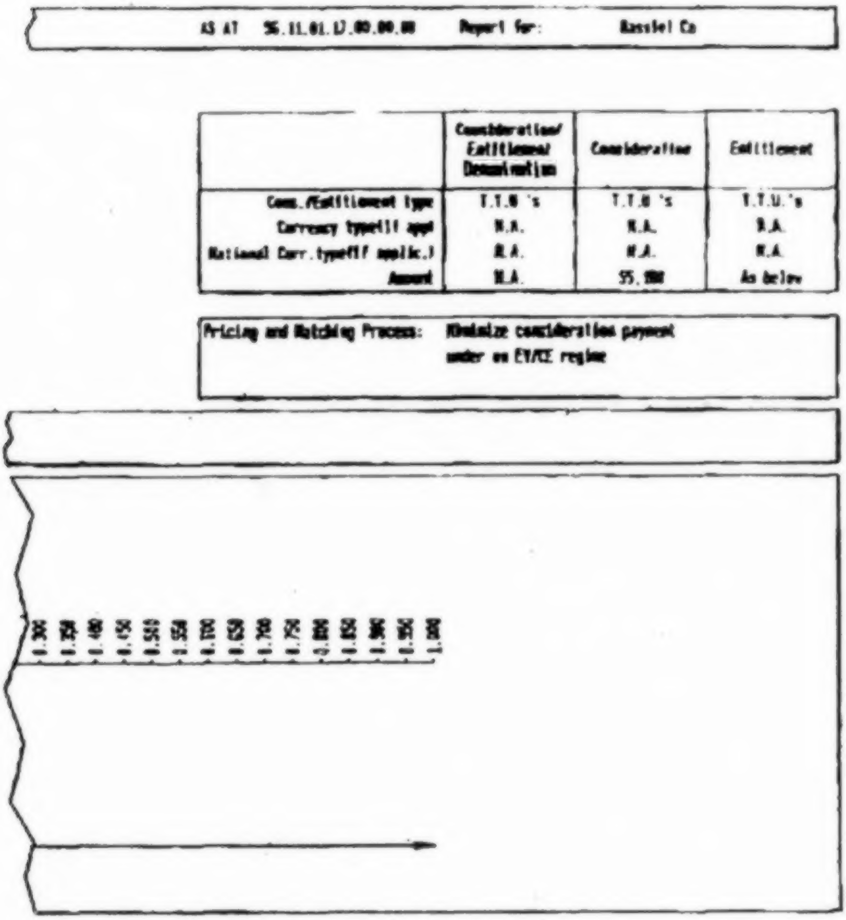
Order ID (if app.) SP837465
Conf.date/time (if app.) 94.05.01 14.38.58.00
Contract/Product content 1 of 1

Valuations as at 95.11.01.17.00.00.00

	F.P.V's	Contract
Expected Value	90.400	395.340
Std. Deviation	0	0

Special Deal Type: Ordering party negative conditional allowed

FIG. 59B



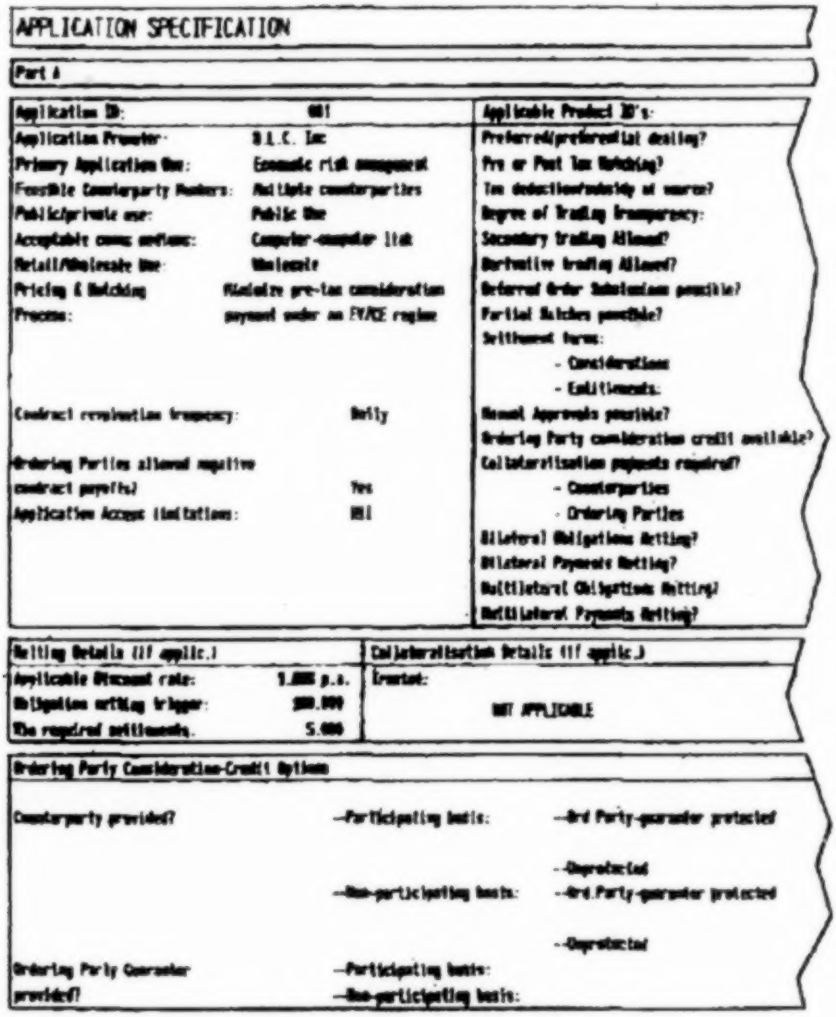
AS AT 96.11.01.12.00.00.00 Report for: Rassle! Co

	Consideration/ Entitlement/ Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U 's	T.T.U 's	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,000	As below

Pricing and Matching Process: Minimize consideration payment under an EY/CE regime

0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 60A



APPLICATION SPECIFICATION

Part A

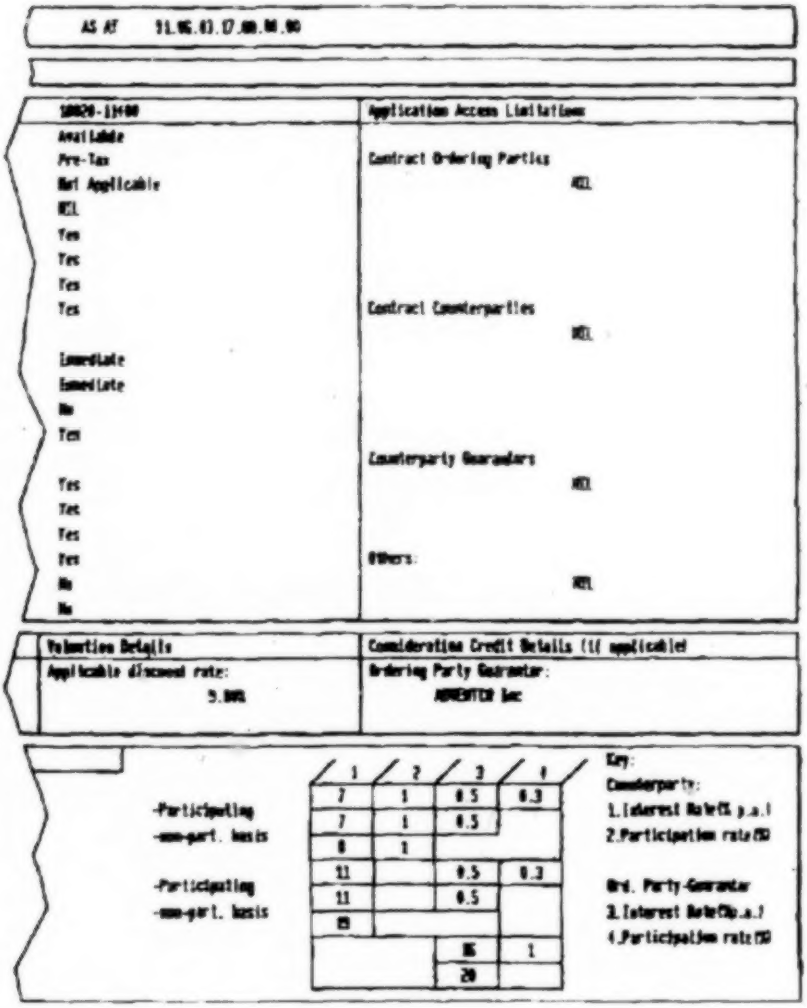
Application ID:	001	Applicable Product ID's:
Application Promoter:	D.L.C. Inc	Preferred/preferential dealing?
Primary Application Use:	Economic risk management	Pre or Post Tax Matching?
Feasible Counterparty Numbers:	Multiple counterparties	Tax deduction/subsidy at source?
Public/private use:	Public Use	Degree of Trading Transparency:
Acceptable comms mediums:	Computer-computer link	Secondary trading Allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading Allowed?
Pricing & Matching Process:	Minimize pre-tax consideration payment under an EV/CE regime	Deferred Order Submissions possible?
		Partial Matches possible?
		Settlement terms: - Considerations - Entitlements.
Contract revaluation frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit available?
Ordering Parties allowed negative contract payoff(s)	Yes	Collateralisation payments required? - Counterparties
Application Access limitations:	Nil	- Ordering Parties
		Bilateral Obligations Netting?
		Bilateral Payments Netting?
		Multilateral Obligations Netting?
		Multilateral Payments Netting?

Netting Details (if applic.)		Collateralisation Details (if applic.)
Applicable Discount rate:	1.00% p.a.	Trustee:
Obligation netting trigger:	$50.000	NOT APPLICABLE
Min required settlements.	5.000	

Ordering Party Consideration-Credit Options

Counterparty provided?	—Participating basis:	—3rd Party-guarantor protected
		—Unprotected
	—Non-participating basis:	—3rd Party-guarantor protected
		—Unprotected
Ordering Party Guarantor provided?	—Participating basis:	
	—Non-participating basis:	

FIG. 608



AS AT 31.05.03.17.00.00.00

10020-11400	Application Access Limitations
Available Pre-Tax Not Applicable NIL Yes Yes Yes Yes Immediate Immediate No Yes Yes Yes Yes Yes No No	Contract Ordering Parties NIL Contract Counterparties NIL Counterparty Guarantors NIL Others: NIL

Valuation Details	Consideration Credit Details (if applicable)
Applicable discount rate: 5.00%	Ordering Party Guarantor: ADVENTCO Inc

-Participating
-non-part. basis

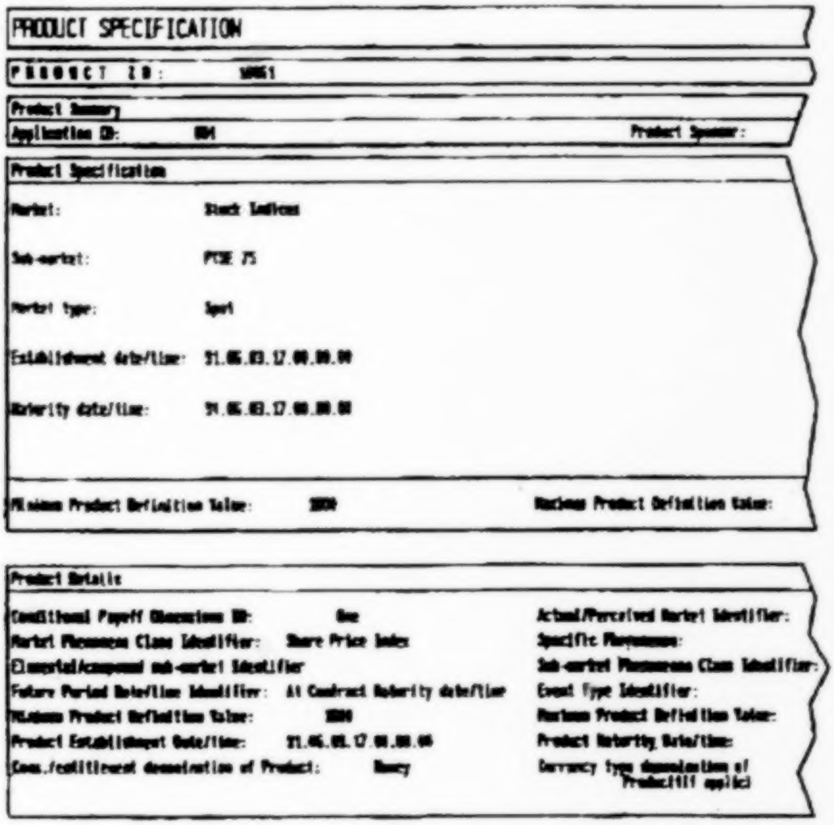
-Participating
-non-part. basis

1	2	3	4
7	1	0.5	0.3
7	1	0.5	
8	1		
11		0.5	0.3
11		0.5	
15			
		15	1
		20	

Key:
Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Ord. Party-Guarantor
3.Interest Rate(% p.a.)
4.Participation rate(%)

FIG. 61A



PRODUCT SPECIFICATION

PRODUCT ID: 10051

Product Summary

Application ID: 004 Product Sponsor:

Product Specification

Market: Stock Indices

Sub-market: FTSE 75

Market type: Spot

Establishment date/time: 31.06.03.17.00.00.00

Maturity date/time: 31.06.03.17.00.00.00

Minimum Product Definition Value: 1000 Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Market Phenomena Class Identifier: Share Price Index

Elemental/compound sub-market Identifier

Future Period Date/time Identifier: At Contract Maturity date/time

Minimum Product Definition Value: 1000

Product Establishment Date/time: 31.06.03.17.00.00.00

Cons./entitlement denomination of Product: Money

Actual/Perceived Market Identifier:

Specific Phenomenon:

Sub-market Phenomena Class Identifier:

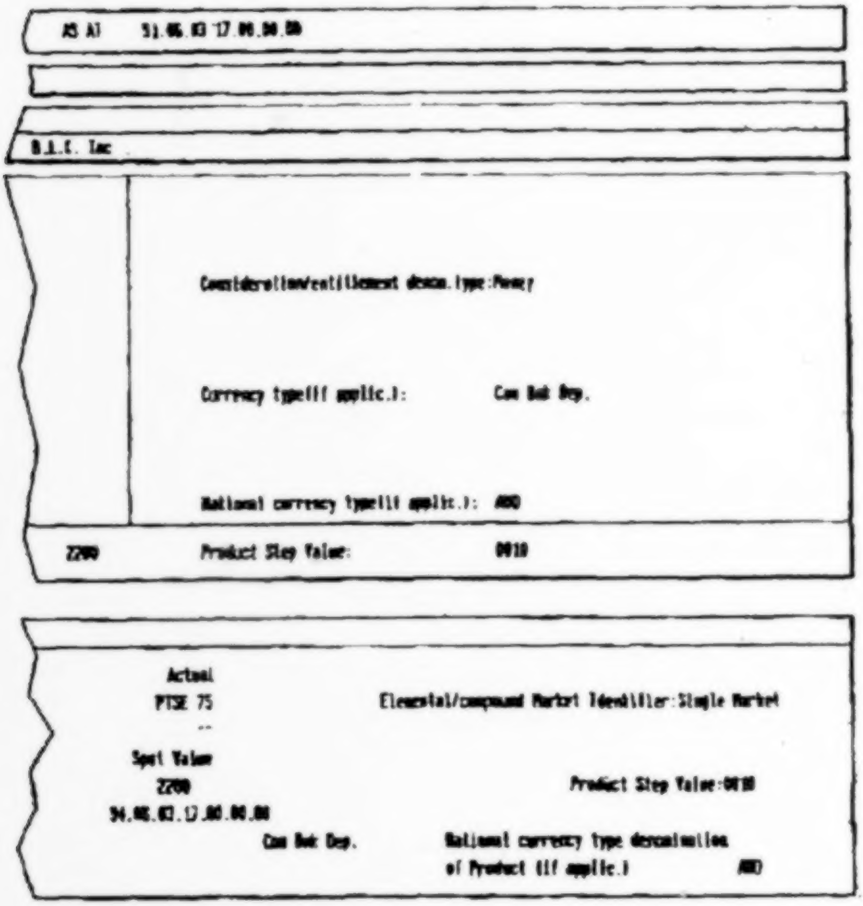
Event Type Identifier:

Maximum Product Definition Value:

Product Maturity Date/time:

Currency type denomination of Product(if applic)

FIG. 61B



AS AI 94.05.03 17.00.00.00

B.I.C. Inc

Consideration/entitlement denom. type: Money

Currency type(if applic.): Con Bnk Dep.

National currency type(if applic.): AUD

2200 Product Step Value: 0010

Actual

FTSE 75

--

Spot Value

2200

94.05.03.17.00.00.00

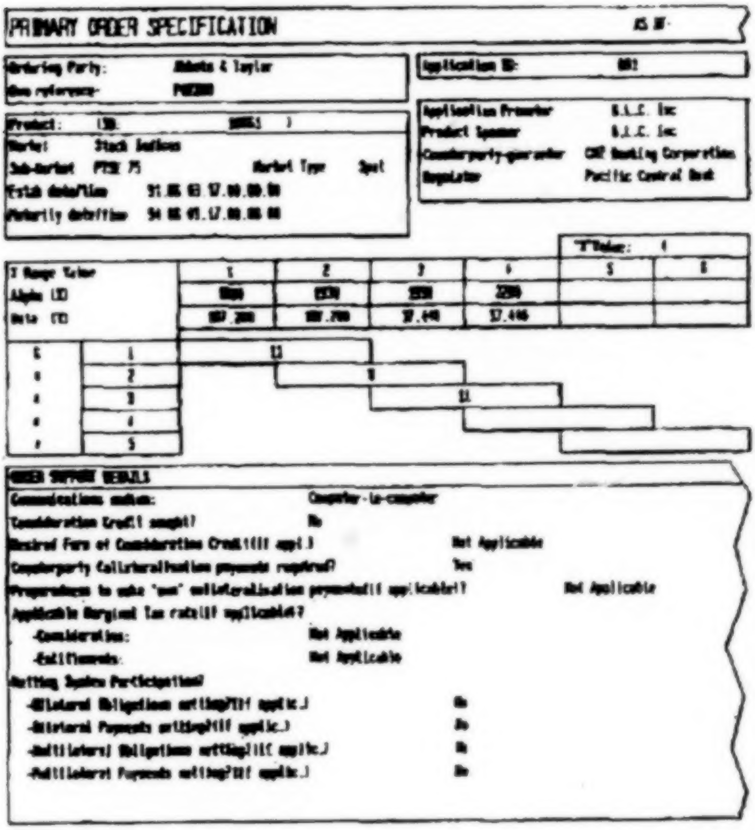
Con Bnk Dep.

Elemental/compound Market Identifier: Single Market

Product Step Value: 0010

National currency type denomination of Product (if applic.) AUD

FIG. 62A



PRIMARY ORDER SPECIFICATION AS OF:

Ordering Party: [illegible] & Taylor
Own reference: [illegible]

Application ID: 001

Product: [illegible]
Market: Stock Indices
Sub-market FTSE 75 Market Type Spot
Estab date/time [illegible]
Maturity date/time [illegible]

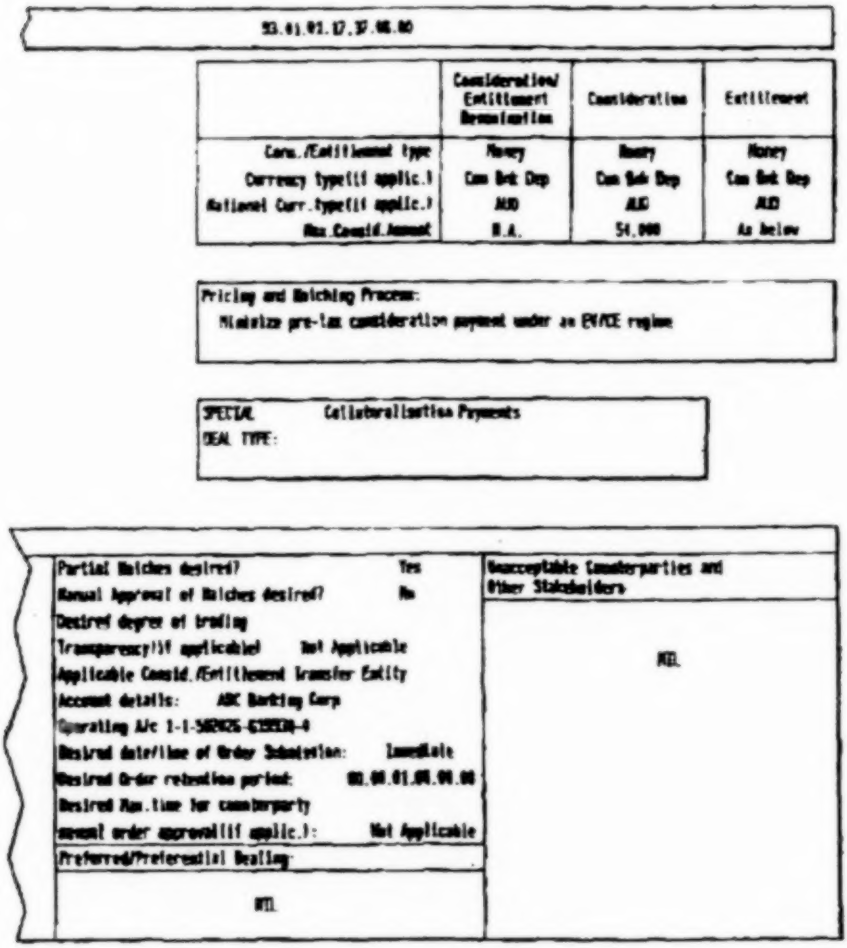
Application Promoter G.L.C. Inc
Product Sponsor G.L.C. Inc
Counterparty-guarantor [illegible] Banking Corporation
Regulator Pacific Central Bank

"Z" Value: [illegible]

Z Range Value	1	2	3	4	5	6
Alpha (D)	[illegible]	[illegible]	[illegible]	[illegible]		
Beta (T)	[illegible]	[illegible]	[illegible]	[illegible]		

ORDER SUPPORT DETAILS
Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? Yes
Preparedness to make "own" collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 62B



53.01.01.17.37.08.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	54,000	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an EV/CE regime

SPECIAL DEAL TYPE: Collateralisation Payments

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-582425-635530-4
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty manual order approval(if applic.): Not Applicable

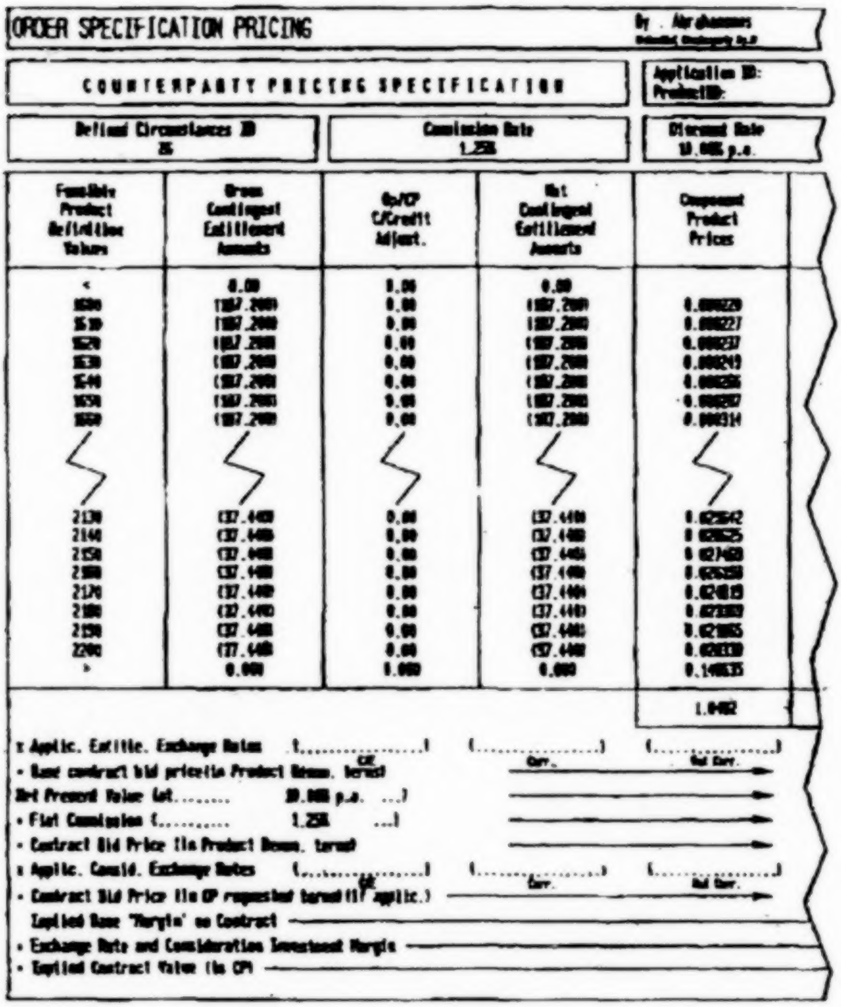
Preferred/Preferential Dealing:

NIL

Unacceptable Counterparties and Other Stakeholders

NIL

FIG. 63A



ORDER SPECIFICATION PRICING

By . Abrahamson

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID	Commission Rate	Discount Rate
25	1.25%	10.00% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
<	0.00	0.00	0.00	
1600	(187.2000)	0.00	(187.2000)	0.000220
1610	(187.2000)	0.00	(187.2000)	0.000227
1620	(187.2000)	0.00	(187.2000)	0.000237
1630	(187.2000)	0.00	(187.2000)	0.000243
1640	(187.2000)	0.00	(187.2000)	0.000256
1650	(187.2000)	0.00	(187.2000)	0.000287
1660	(187.2000)	0.00	(187.2000)	0.000314
2130	(37.4400)	0.00	(37.4400)	0.025642
2140	(37.4400)	0.00	(37.4400)	0.026625
2150	(37.4400)	0.00	(37.4400)	0.027460
2160	(37.4400)	0.00	(37.4400)	0.026250
2170	(37.4400)	0.00	(37.4400)	0.024815
2180	(37.4400)	0.00	(37.4400)	0.023303
2190	(37.4400)	0.00	(37.4400)	0.021865
2200	(37.4400)	0.00	(37.4400)	0.020330
>	0.000	0.000	0.000	0.140635
				1.0482

x Applic. Entitle. Exchange Rates (..................) (..................) (..................)

CCE Curr. Ref Curr.

= Base contract bid price (in Product Denom. terms)

Net Present Value (at .... 10.00% p.a. ...)

+ Flat Commission (.......... 1.25% ...)

= Contract Bid Price (in Product Denom. terms)

x Applic. Consid. Exchange Rates (..................) (..................) (..................)

CCE Curr. Ref Curr.

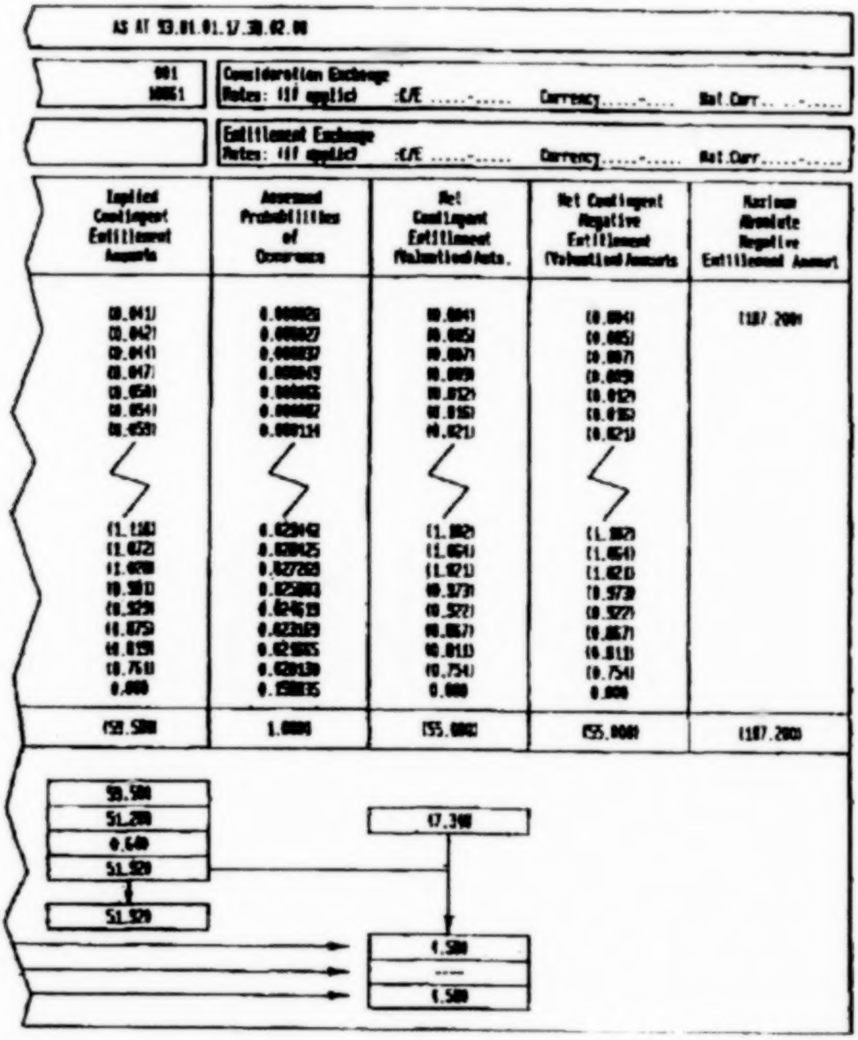
= Contract Bid Price (in CP requested terms) (if applic.)

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

= Implied Contract Value (in CP)

FIG. 63B



AS AT 53.01.01.17.30.02.00

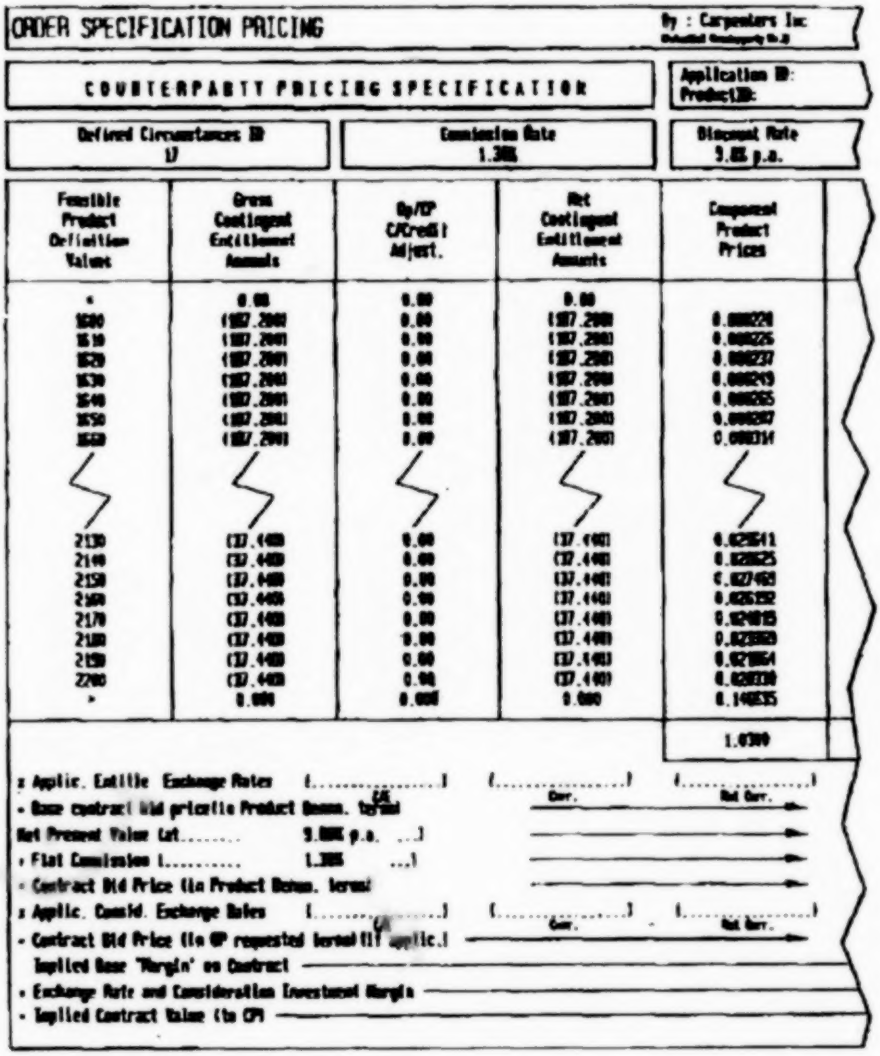
001
10061

Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurrence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(0.041)	0.000025	(0.004)	(0.004)	(187.200)
(0.042)	0.000027	(0.005)	(0.005)	
(0.044)	0.000037	(0.007)	(0.007)	
(0.047)	0.000043	(0.009)	(0.009)	
(0.050)	0.000065	(0.012)	(0.012)	
(0.054)	0.000082	(0.016)	(0.016)	
(0.059)	0.000114	(0.021)	(0.021)	
(1.118)	0.029442	(1.102)	(1.102)	
(1.072)	0.028425	(1.064)	(1.064)	
(1.028)	0.027265	(1.021)	(1.021)	
(0.981)	0.025983	(0.973)	(0.973)	
(0.929)	0.024619	(0.922)	(0.922)	
(0.875)	0.023169	(0.867)	(0.867)	
(0.819)	0.021655	(0.811)	(0.811)	
(0.761)	0.020130	(0.754)	(0.754)	
0.000	0.158835	0.000	0.000	
(59.500)	1.0000	(55.000)	(55.000)	(187.200)

FIG. 64A



ORDER SPECIFICATION PRICING

By : Carpenters Inc
(Defined Counterparty No.3)

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID:

Defined Circumstances ID	Commission Rate	Discount Rate
17	1.30%	5.0% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
<	0.00	0.00	0.00	
1600	(187.2000)	0.00	(187.2000)	0.000220
1610	(187.2000)	0.00	(187.2000)	0.000225
1620	(187.2000)	0.00	(187.2000)	0.000237
1630	(187.2000)	0.00	(187.2000)	0.000249
1640	(187.2000)	0.00	(187.2000)	0.000265
1650	(187.2000)	0.00	(187.2000)	0.000287
1660	(187.2000)	0.00	(187.2000)	0.000314
2130	(37.4400)	0.00	(37.4400)	0.029641
2140	(37.4400)	0.00	(37.4400)	0.028625
2150	(37.4400)	0.00	(37.4400)	0.027469
2160	(37.4400)	0.00	(37.4400)	0.026192
2170	(37.4400)	0.00	(37.4400)	0.024815
2180	(37.4400)	0.00	(37.4400)	0.023389
2190	(37.4400)	0.00	(37.4400)	0.021864
2200	(37.4400)	0.00	(37.4400)	0.020330
>	0.000	0.000	0.000	0.148535
				1.0300

x Applic. Entitle Exchange Rates (..................) (..................) (..................)

= Base contract Bid price(in Product Denom. terms) C/E Curr. Bid Curr.

Net Present Value (at........ 5.00% p.a. ...)

+ Flat Commission (.......... 1.30% ...)

= Contract Bid Price (in Product Denom. terms)

x Applic. Consid. Exchange Rates (..................) (..................) (..................)

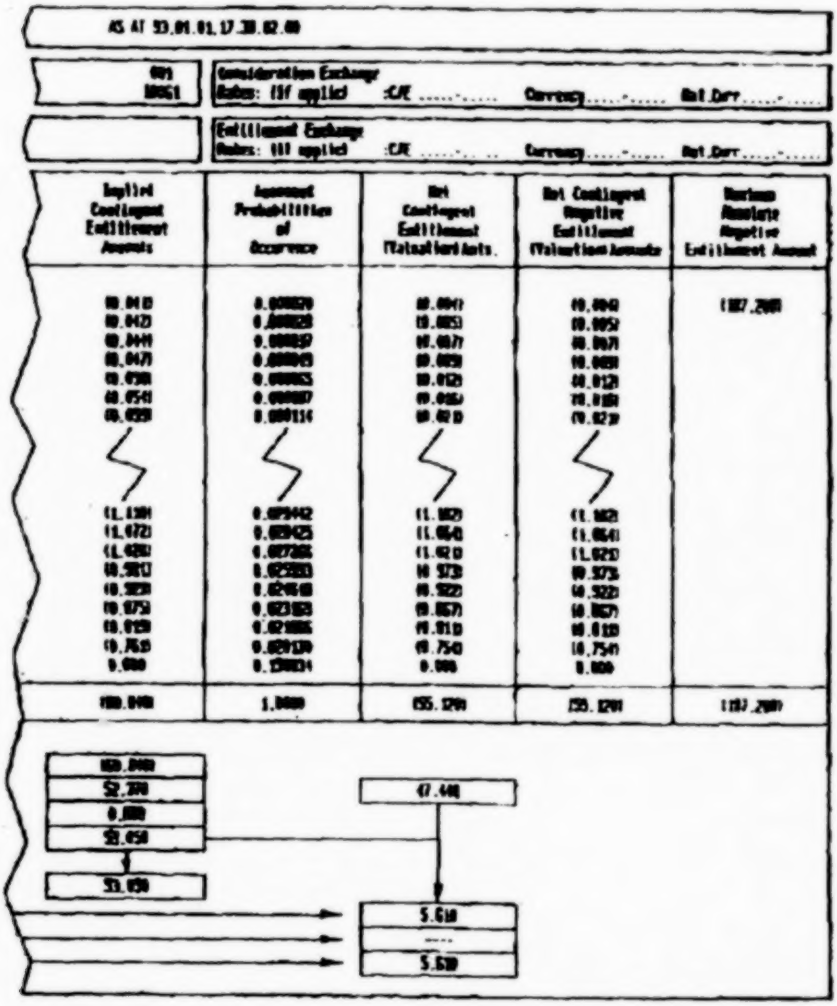
= Contract Bid Price (in CP requested terms)(if applic.) C/E Curr. Bid Curr.

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

= Implied Contract Value (to CP)

FIG. 64B



AS AT 53.01.01.17.38.02.00

001
10051

Consideration Exchange
Rates: (If applic) :C/E .....-..... Currency.....-..... Bat.Curr.....-.....

Entitlement Exchange
Rates: (If applic) :C/E .....-..... Currency.....-..... Bat.Curr.....-.....

Implied Contingent Entitlement Amounts	Agreement Probabilities of Occurrence	Net Contingent Entitlement Valuation Amts.	Net Contingent Negative Entitlement Valuation Amounts	Maximum Absolute Negative Entitlement Amount
(0.041)	0.000020	(0.0041)	(0.0049)	(187.200)
(0.042)	0.000028	(0.0053)	(0.0052)	
(0.044)	0.000037	(0.0071)	(0.0071)	
(0.047)	0.000049	(0.0090)	(0.0090)	
(0.050)	0.000065	(0.0121)	(0.0121)	
(0.054)	0.000087	(0.0161)	(0.0161)	
(0.059)	0.000114	(0.0213)	(0.0213)	
(1.130)	0.029442	(1.102)	(1.102)	
(1.072)	0.028425	(1.064)	(1.064)	
(1.020)	0.027266	(1.021)	(1.021)	
(0.981)	0.025983	(0.973)	(0.973)	
(0.929)	0.024610	(0.922)	(0.922)	
(0.875)	0.023183	(0.867)	(0.867)	
(0.819)	0.021686	(0.811)	(0.811)	
(0.765)	0.020130	(0.754)	(0.754)	
0.000	0.150834	0.000	0.000	
(100.040)	1.0000	(55.1291)	(55.1291)	(187.200)

100.040
52.390
0.000
53.050

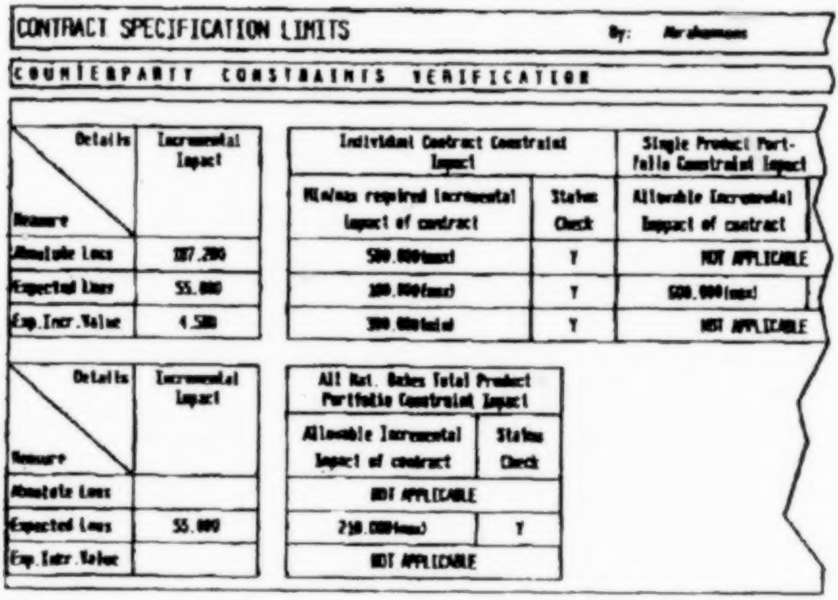
53.050

47.440

5.610

5.610

FIG. 65A



CONTRACT SPECIFICATION LIMITS By: [illegible]

COUNTERPARTY CONSTRAINTS VERIFICATION

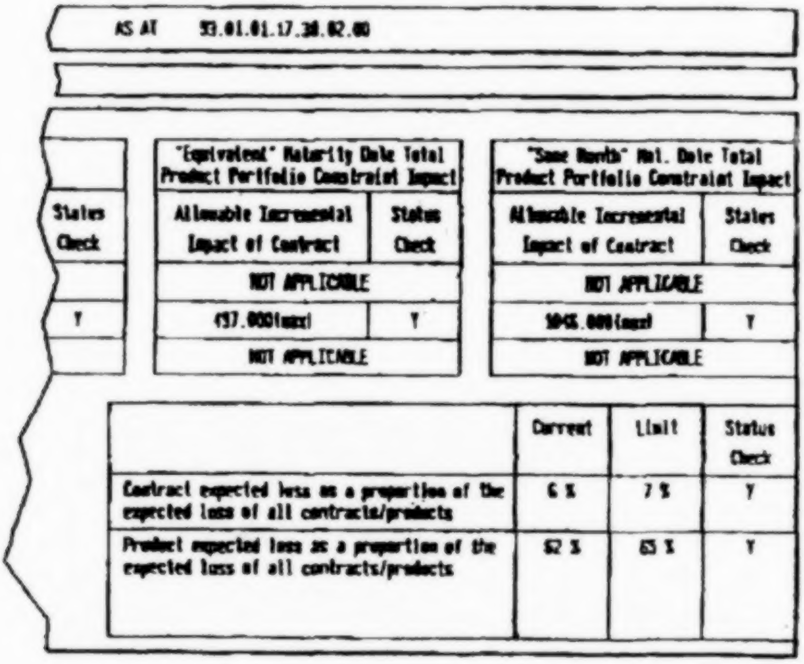
Details / Measure	Incremental Impact
Absolute Loss	107.200
Expected Loss	55.000
Exp.Incr.Value	4.500

Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
Min/max required incremental impact of contract	Status Check	Allowable Incremental Impact of contract
500.000(max)	Y	NOT APPLICABLE
100.000(max)	Y	600.000(max)
300.000(min)	Y	NOT APPLICABLE

Details / Measure	Incremental Impact
Absolute Loss	
Expected Loss	55.000
Exp.Incr.Value	

All Rat. Dates Total Product Portfolio Constraint Impact	
Allowable Incremental Impact of contract	Status Check
NOT APPLICABLE	
250.000(max)	Y
NOT APPLICABLE	

FIG. 65B

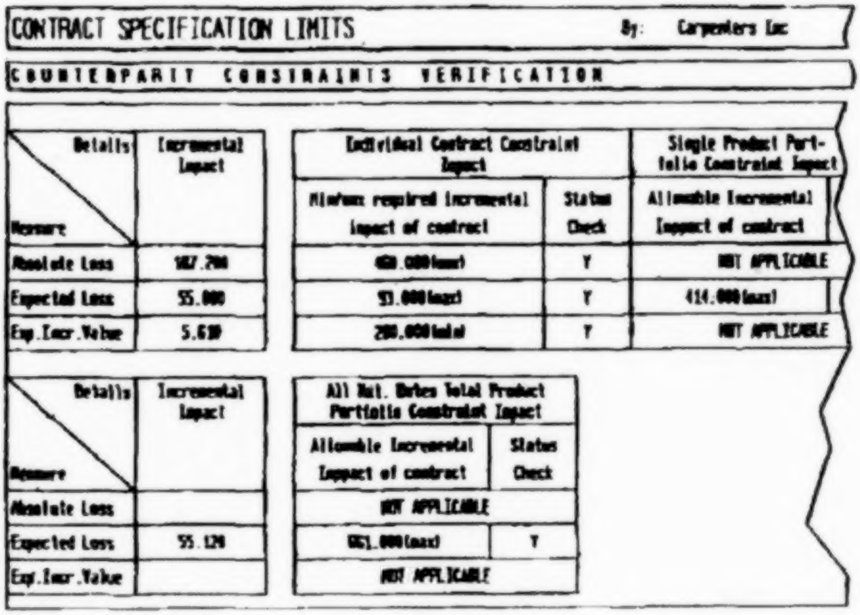


AS AT 93.01.01.17.30.02.00

	"Equivalent" Maturity Date Total Product Portfolio Constraint Impact		"Same Month" Mat. Date Total Product Portfolio Constraint Impact	
Status Check	Allowable Incremental Impact of Contract	Status Check	Allowable Incremental Impact of Contract	Status Check
	NOT APPLICABLE		NOT APPLICABLE	
Y	457.000(max)	Y	1045.000(max)	Y
	NOT APPLICABLE		NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	6 %	7 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	52 %	65 %	Y

FIG. 66A



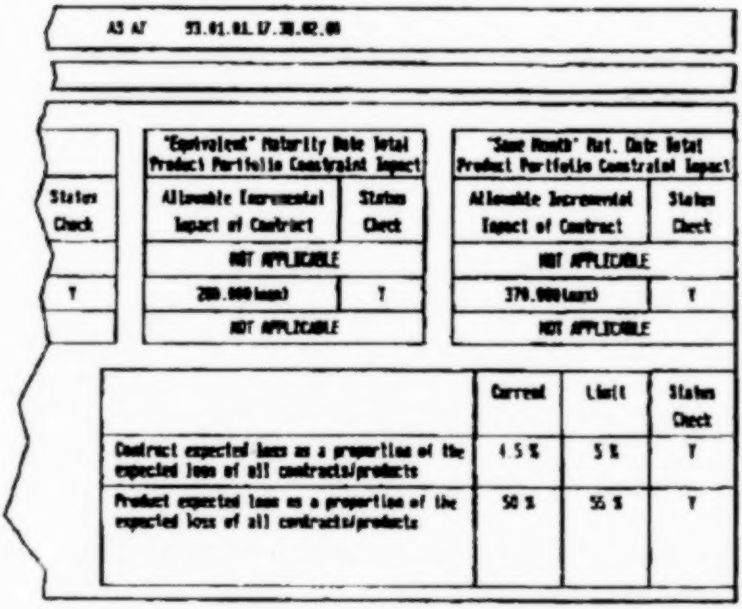
CONTRACT SPECIFICATION LIMITS By: Carpenters Inc

COUNTERPARTY CONSTRAINTS VERIFICATION

Details / Measure	Incremental Impact	Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
		Minimum required incremental impact of contract	Status Check	Allowable Incremental Impact of contract
Absolute Loss	187.200	400.000(max)	Y	NOT APPLICABLE
Expected Loss	55.000	53.000(max)	Y	414.000(max)
Exp.Incr.Value	5.610	200.000total	Y	NOT APPLICABLE

Details / Measure	Incremental Impact	All Mat. Dates Total Product Portfolio Constraint Impact	
		Allowable Incremental Impact of contract	Status Check
Absolute Loss		NOT APPLICABLE	
Expected Loss	55.120	661.000(max)	Y
Exp.Incr.Value		NOT APPLICABLE	

FIG. 66B

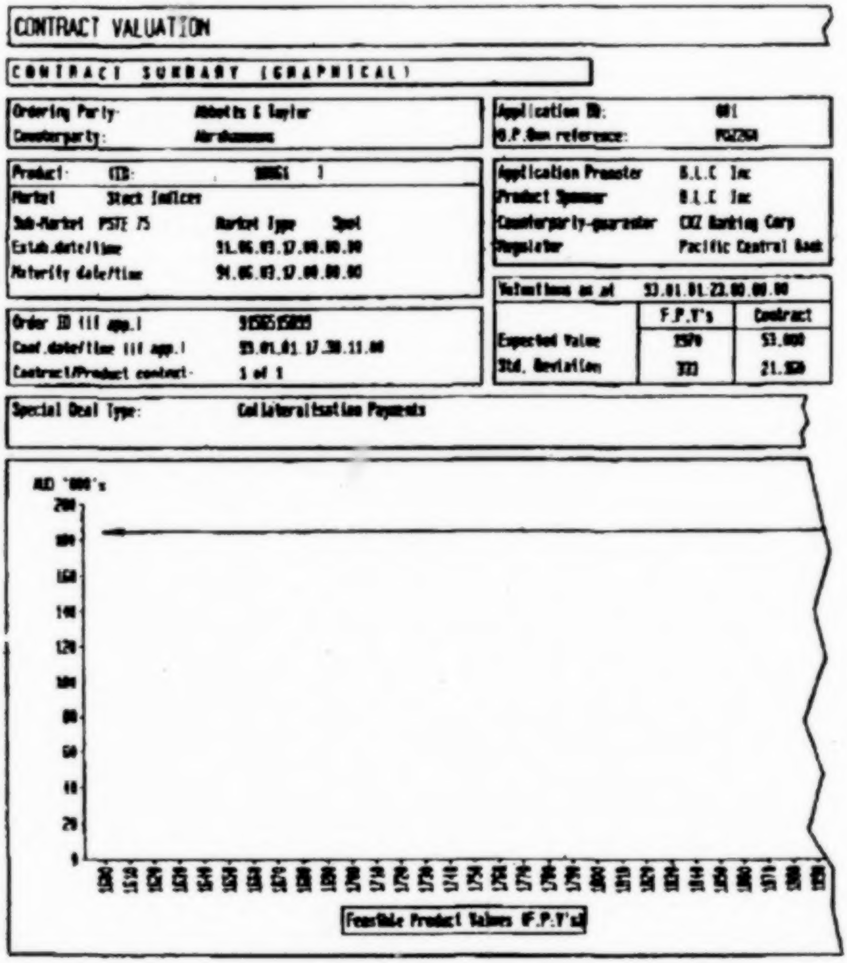


AS AT 53.01.01.17.30.02.00

Status Check	"Equivalent" Maturity Date Total Product Portfolio Constraint Impact: Allowable Incremental Impact of Contract	Status Check	"Same Month" Mat. Date Total Product Portfolio Constraint Impact: Allowable Incremental Impact of Contract	Status Check
	NOT APPLICABLE		NOT APPLICABLE	
Y	200.000(usd)	Y	370.000(usd)	Y
	NOT APPLICABLE		NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	4.5 %	5 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	50 %	55 %	Y

FIG. 67A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Abbotts & Taylor
Counterparty: [illegible]

Application ID: 001
O.P. Own reference: PGZ26A

Product: (ID: 10051)
Market: Stock Indices
Sub-Market: FSTE 75 Market Type: Spot
Estab. date/time: 91.06.03.17.00.00.00
Maturity date/time: 94.06.03.17.00.00.00

Application Promoter: B.L.C Inc
Product Sponsor: B.L.C Inc
Counterparty-guarantor: CXZ Banking Corp
Regulator: Pacific Central Bank

Order ID (if app.): 9150515005
Conf. date/time (if app.): 93.01.01.17.30.11.00
Contract/Product content: 1 of 1

Valuations as at: 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1570	53,000
Std. Deviation	333	21,550

Special Deal Type: Collateralisation Payments

FIG. 67B

AS AT: 97.01.01.23.00.00.00 Report for: Abbotts & Taylor

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Can Bnk dep.	Can Bnk dep.	Can Bnk dep.
Notional Curr. type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	$1,599	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an EV/CE regime

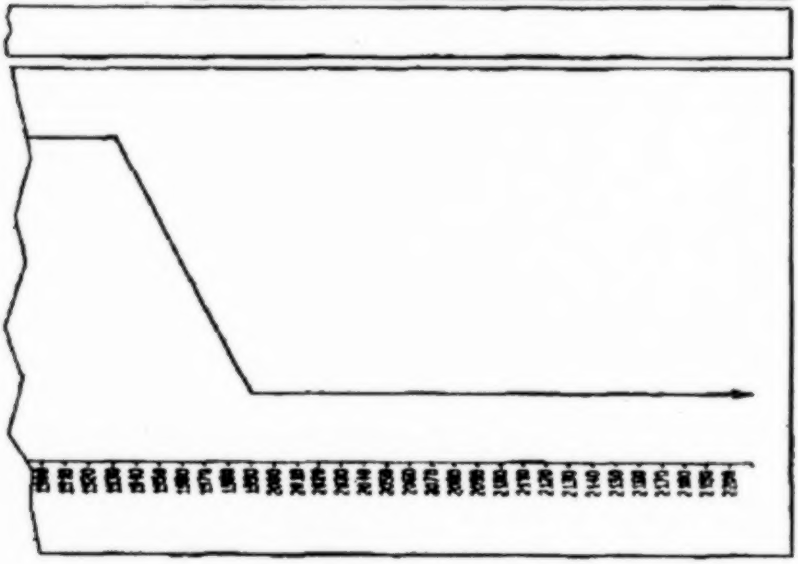
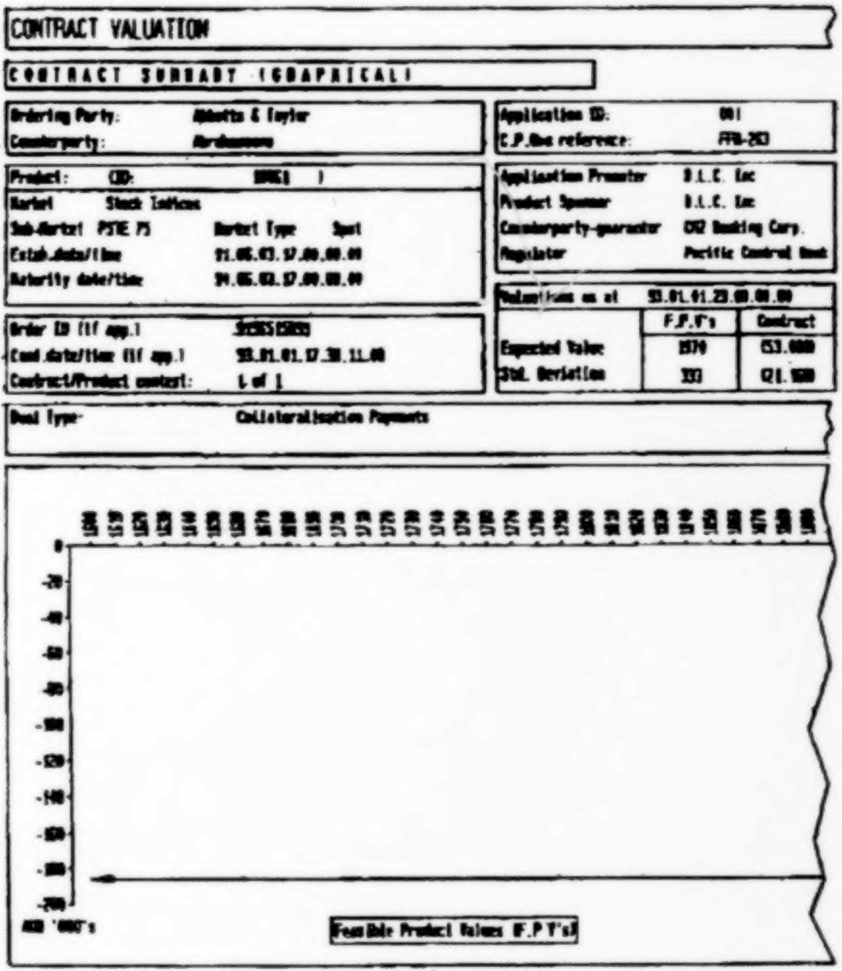


FIG. 68A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Abbotts & Taylor
Counterparty: [illegible]

Product: CID: 10061)
Market Stock Indices
Sub-Market FSTE 75 Market Type Spot
Estab.date/time 91.05.03.17.00.00.00
Maturity date/time 94.05.03.17.00.00.00

Order ID (if app.) 5565585
Cond.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product context: 1 of 1

Application ID: 001
C.P.Ons reference: FFB-283

Application Promoter D.L.C. Inc
Product Sponsor D.L.C. Inc
Counterparty-guarantor CHZ Banking Corp.
Regulator Pacific Central Bank

Valuations as at 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1570	153.000
Std. Deviation	333	121.500

Deal Type: Collateralisation Payments

FIG. 68B

AS AT 33.01.01.23.00.00.00 Report for. Airdhamnes

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	51,520	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an ET/CE regime

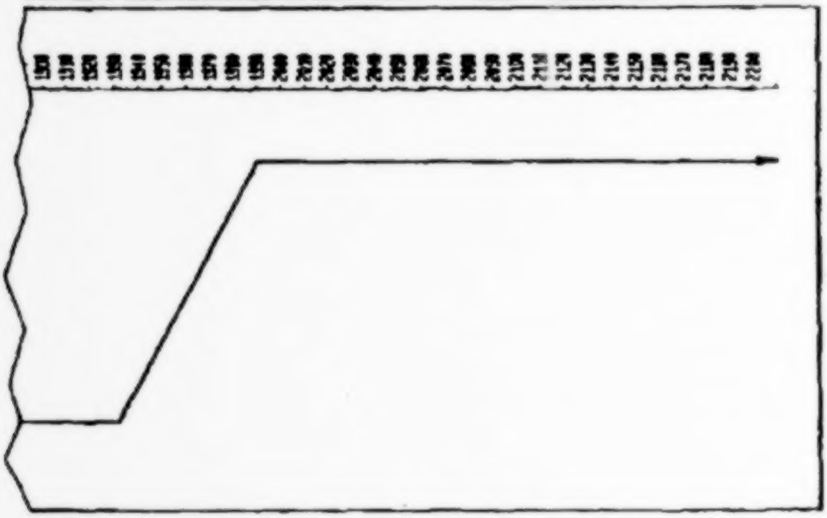
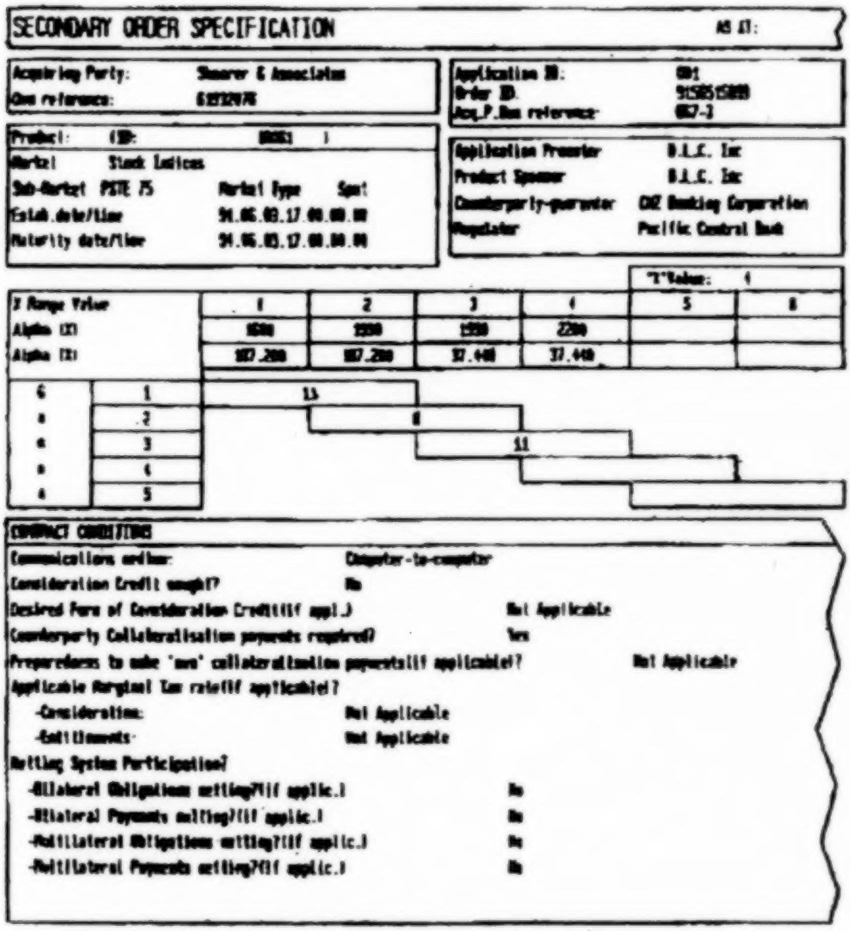


FIG. 69A



SECONDARY ORDER SPECIFICATION AS AT:

Acquiring Party: Shearer & Associates
Own reference: 61232076

Application ID: 001
Order ID: 9158515000
Acq.P.Bus reference: 007-3

Product: (ID: 00061)
Market Stock Indices
Sub-Market PSTE 75 Market Type Spot
Estab.date/time 94.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter D.I.C. Inc
Product Sponsor D.I.C. Inc
Counterparty-guarantor CHZ Banking Corporation
Regulator Pacific Central Bank

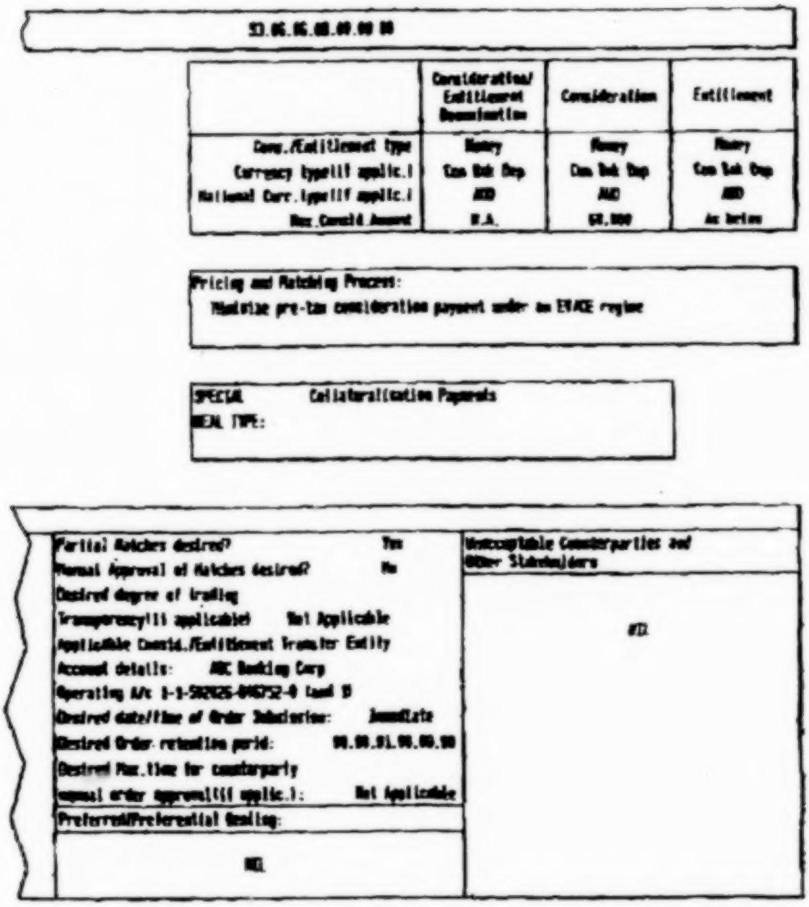
"Y"Value: 4

Y Range Value	1	2	3	4	5	6
Alpha (X)	1600	1900	1900	2200		
Alpha (X)	187.200	187.200	37.440	37.440		

CONTRACT CONDITIONS

Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? Yes
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 69B



53.06.06.00.00.00 00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	60,000	As below

Pricing and Matching Process:
Maximise pre-tax consideration payment under an EVACE regime

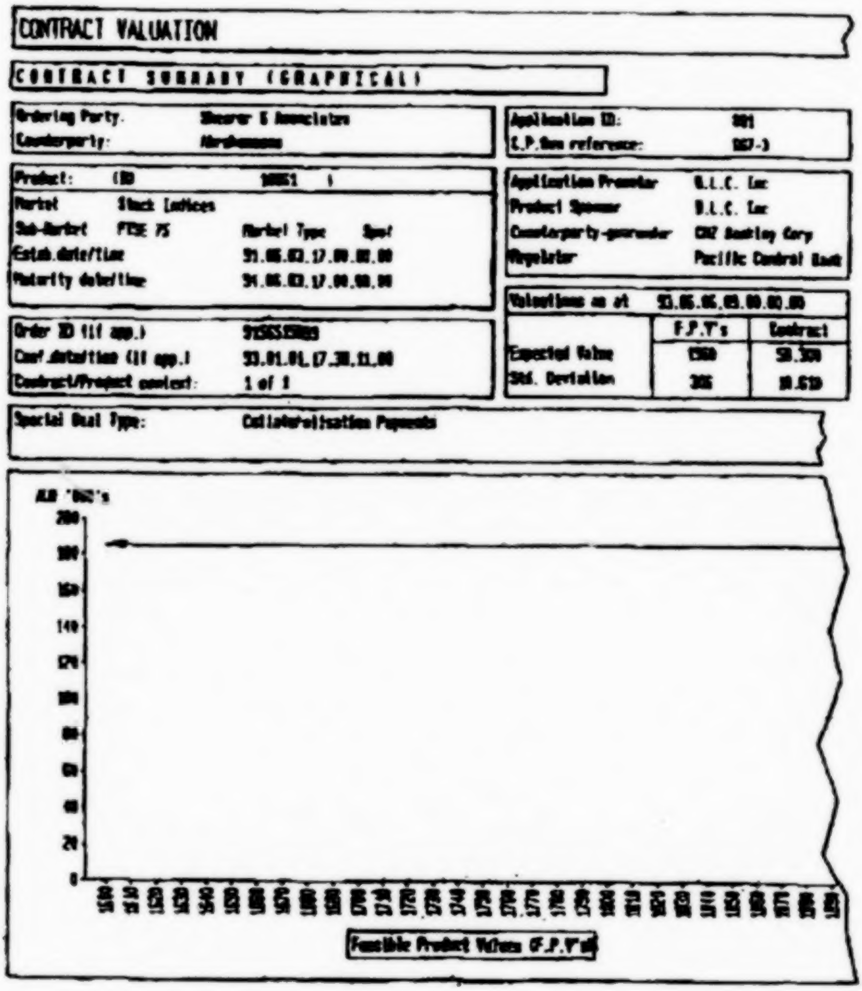
SPECIAL DEAL TYPE: Collateralization Payments

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity Account details: ABC Banking Corp Operating A/c 1-1-592025-046752-0 (and 1)
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty manual order approval(if applic.): Not Applicable

Preferred/Preferential Dealing:
NIL

Unacceptable Counterparties and Other Stakeholders:
NIL

FIG. 70A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Shearer & Associates
Counterparty: [illegible]

Product: (ID 10051)
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab. date/time 93.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Order ID (if app.) [illegible]
Conf. date/time (if app.) 93.01.01.17.30.11.00
Contract/Product context: 1 of 1

Special Deal Type: Collateralisation Payments

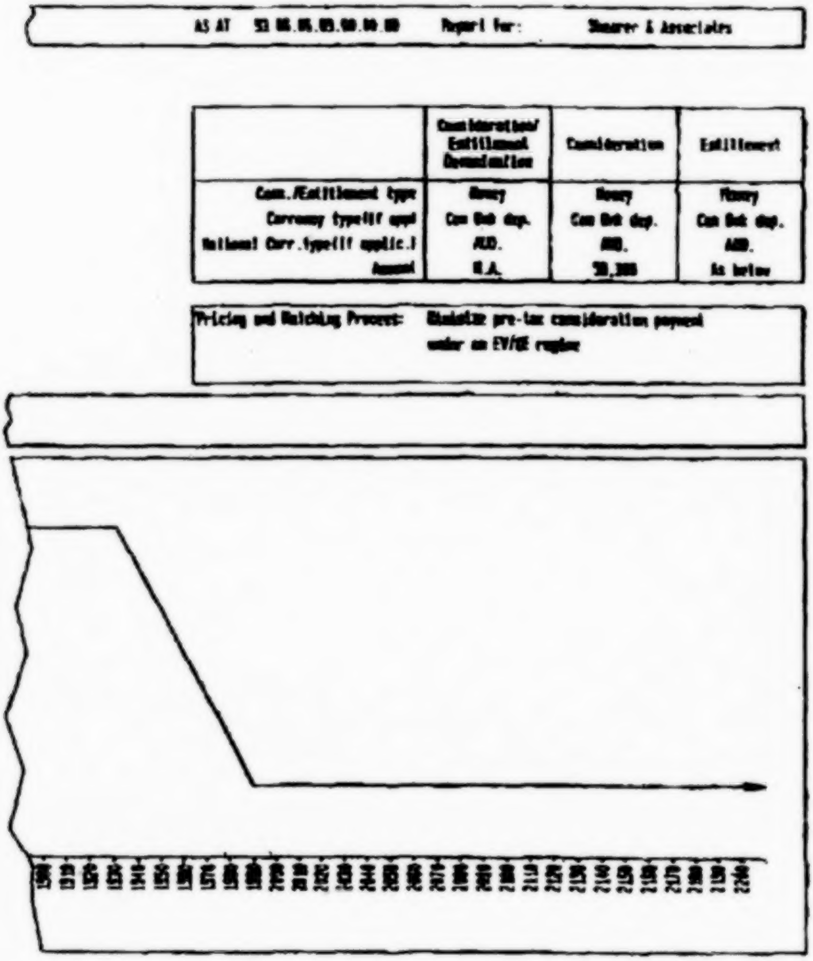
Application ID: 001
C.P. Box reference: 057-3

Application Promoter D.L.C. Inc
Product Sponsor D.L.C. Inc
Counterparty-guarantor CHZ Banking Corp
Regulator Pacific Central Bank

Valuations as at 93.05.06.05.00.00.00

	F.P.V's	Contract
Expected Value	1560	58.300
Std. Deviation	305	10.610

FIG. 70B

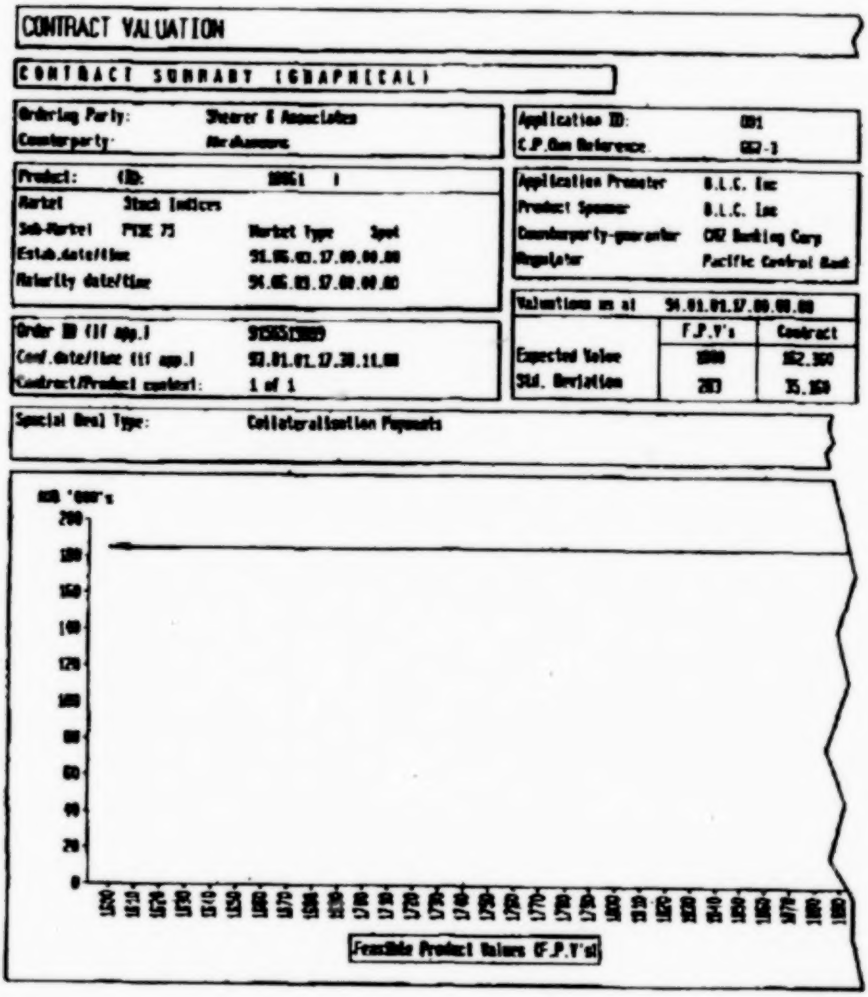


AS AT 53 05.05.05.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50,000	As below

Pricing and Matching Process: Minimise pre-tax consideration payment under an EV/NE regime

FIG. 71A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Shearer & Associates
Counterparty: [illegible]

Application ID: 001
C.P.Own Reference: 007-3

Product: (ID: 10061 1
Market Stock Indices
Sub-Market FTSE 75 Market type Spot
Estab.date/time 91.05.03.17.00.00.00
Maturity date/time 94.05.03.17.00.00.00

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CBZ Banking Corp
Regulator Pacific Central Bank

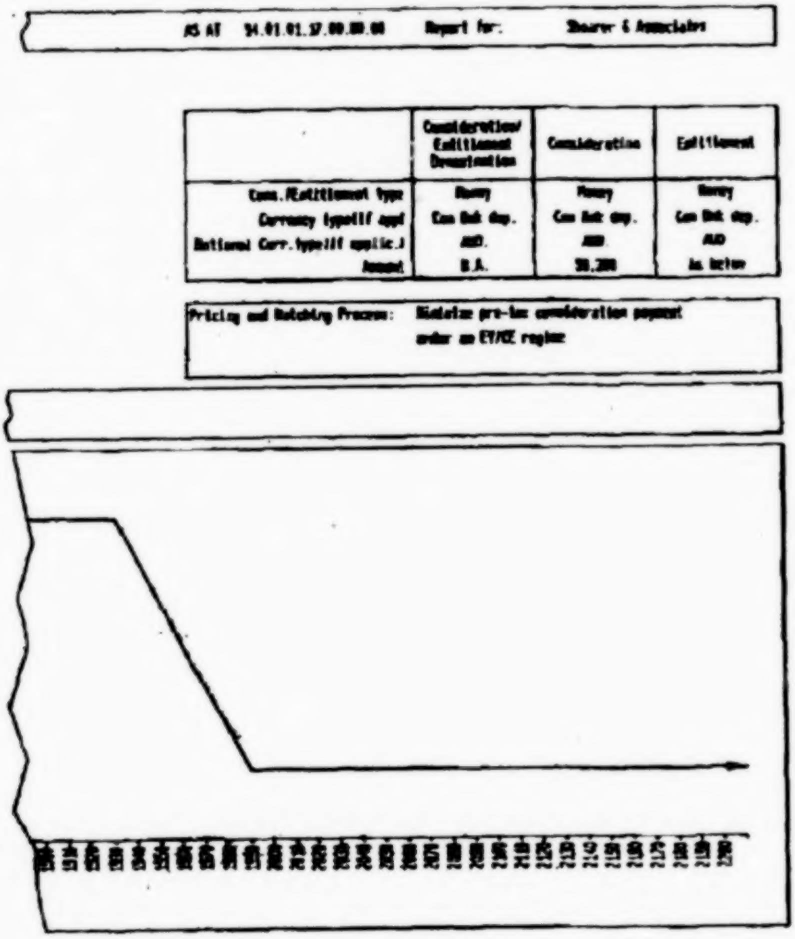
Order ID (if app.) 91565(1000)
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product content: 1 of 1

Valuations as at 94.01.01.17.00.00.00

	F.P.V's	Contract
Expected Value	1800	182.350
Std. Deviation	283	35.160

Special Deal Type: Collateralisation Payments

FIG. 71B

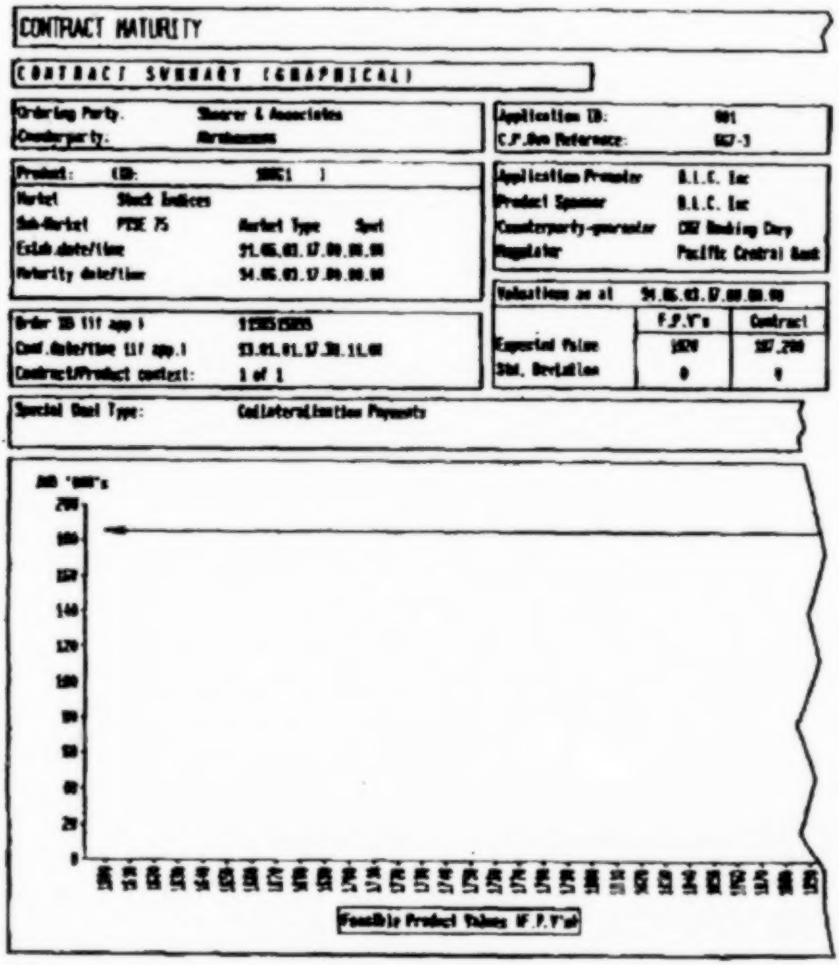


AS AT 94.01.01.17.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Can Bnk dep.	Can Bnk dep.	Can Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD
Amount	N.A.	30,200	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an ET/CE regime

FIG. 72A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party. Shearer & Associates
Counterparty. [illegible]

Product: (ID: [illegible])
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab.date/time 91.05.03.17.00.00.00
Maturity date/time 94.05.03.17.00.00.00

Order ID (if app.) [illegible]
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product context: 1 of 1

Special Deal Type: Collateralisation Payments

Application ID: 801
C.P.Ops Reference: [illegible]

Application Promoter B.I.C. Inc
Product Sponsor B.I.C. Inc
Counterparty-guarantor [illegible] Banking Corp
Regulator Pacific Central Bank

Valuations as at 94.05.03.17.00.00.00

	F.P.V's	Contract
Expected Value	[illegible]	[illegible]
Std. Deviation	0	0

FIG. 72B

AS AT 14.06.03 17.00 00.00 Report for- Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(If appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(If applic.)	AUD.	AUD.	AUD.
Amount	N.A	50,300	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

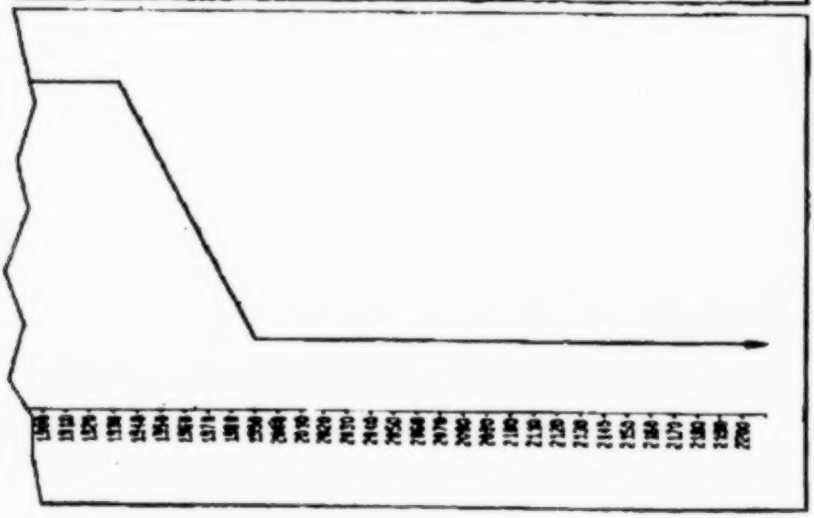
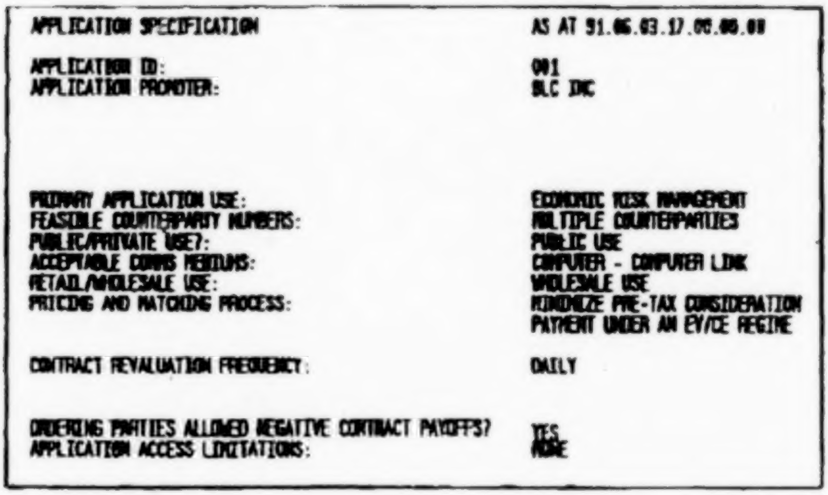


FIG. 73



APPLICATION SPECIFICATION AS AT 91.06.03.17.00.00.00

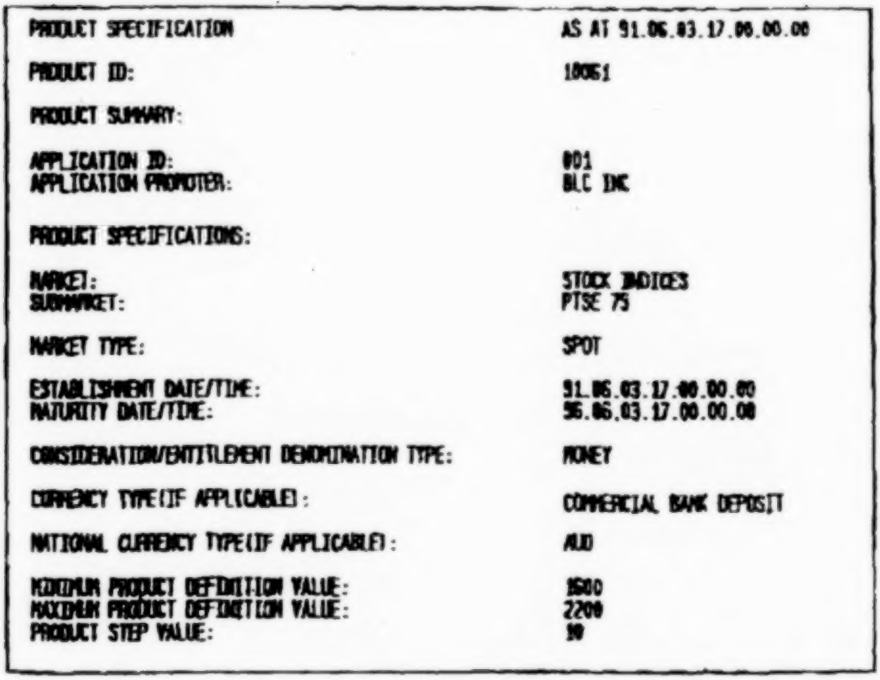
APPLICATION ID: 001
APPLICATION PROMOTER: BLC INC

PRIMARY APPLICATION USE: ECONOMIC RISK MANAGEMENT
FEASIBLE COUNTERPARTY NUMBERS: MULTIPLE COUNTERPARTIES
PUBLIC/PRIVATE USE?: PUBLIC USE
ACCEPTABLE COMMS MEDIUMS: COMPUTER - COMPUTER LINK
RETAIL/WHOLESALE USE: WHOLESALE USE
PRICING AND MATCHING PROCESS: MINIMIZE PRE-TAX CONSIDERATION PAYMENT UNDER AN EV/CE REGIME

CONTRACT REVALUATION FREQUENCY: DAILY

ORDERING PARTIES ALLOWED NEGATIVE CONTRACT PAYOFFS? YES
APPLICATION ACCESS LIMITATIONS: NONE

FIG. 74



```
PRODUCT SPECIFICATION                                   AS AT 91.06.03.17.00.00.00

PRODUCT ID:                                             10061

PRODUCT SUMMARY:

APPLICATION ID:                                         001
APPLICATION PROMOTER:                                   BLC INC

PRODUCT SPECIFICATIONS:

MARKET:                                                 STOCK INDICES
SUBMARKET:                                              PTSE 75

MARKET TYPE:                                            SPOT

ESTABLISHMENT DATE/TIME:                                91.06.03.17.00.00.00
MATURITY DATE/TIME:                                     96.06.03.17.00.00.00

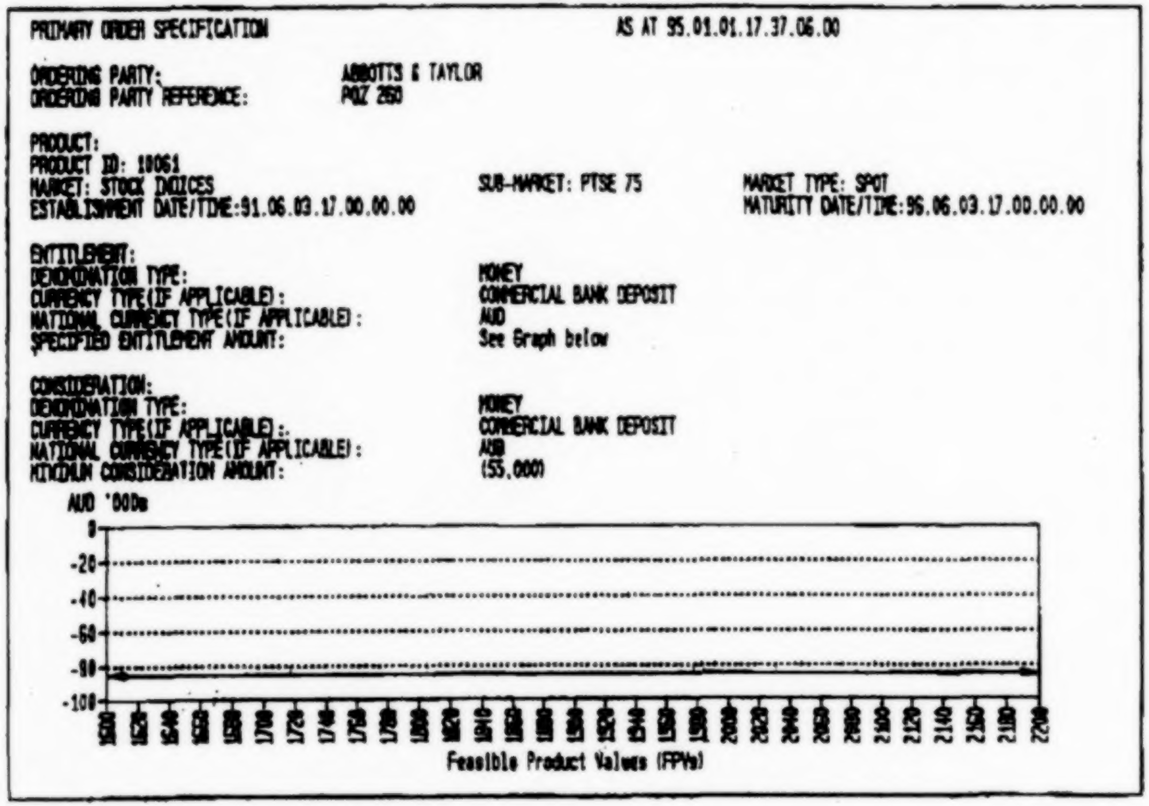
CONSIDERATION/ENTITLEMENT DENOMINATION TYPE:            MONEY

CURRENCY TYPE(IF APPLICABLE):                           COMMERCIAL BANK DEPOSIT

NATIONAL CURRENCY TYPE(IF APPLICABLE):                  AUD

MINIMUM PRODUCT DEFINITION VALUE:                       1600
MAXIMUM PRODUCT DEFINITION VALUE:                       2200
PRODUCT STEP VALUE:                                     10
```

FIG. 75



PRIMARY ORDER SPECIFICATION AS AT 95.01.01.17.37.06.00

ORDERING PARTY: ABBOTTS & TAYLOR
ORDERING PARTY REFERENCE: POZ 260

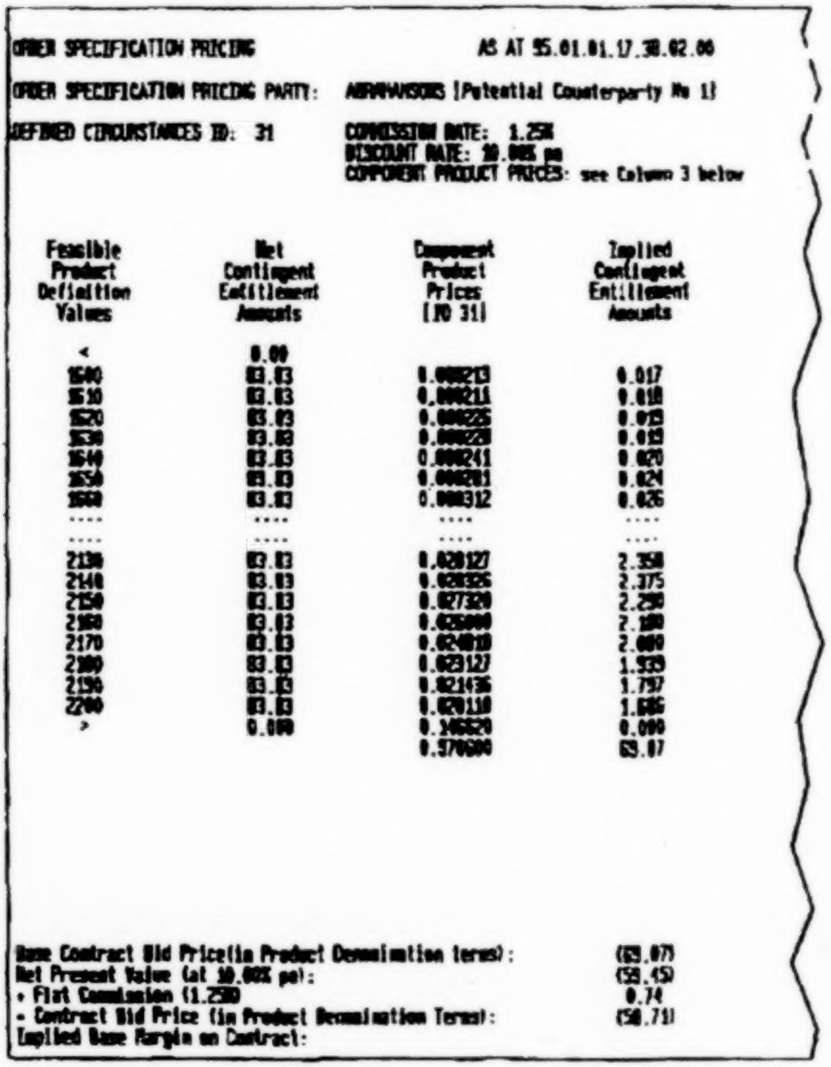
PRODUCT:
PRODUCT ID: 10061
MARKET: STOCK INDICES SUB-MARKET: FTSE 75 MARKET TYPE: SPOT
ESTABLISHMENT DATE/TIME:91.06.03.17.00.00.00 MATURITY DATE/TIME:96.06.03.17.00.00.00

ENTITLEMENT:
DENOMINATION TYPE: MONEY
CURRENCY TYPE(IF APPLICABLE): COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE): AUD
SPECIFIED ENTITLEMENT AMOUNT: See Graph below

CONSIDERATION:
DENOMINATION TYPE: MONEY
CURRENCY TYPE(IF APPLICABLE): COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE): AUD
MINIMUM CONSIDERATION AMOUNT: (55,000)

AUD '000s
0
-20
-40
-60
-80
-100
1500
1520
1540
1560
1580
1700
1720
1740
1760
1780
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
2020
2040
2060
2080
2100
2120
2140
2160
2180
2200
Feasible Product Values (FPVs)

FIG. 76A



```
ORDER SPECIFICATION PRICING                              AS AT 95.01.01.17.30.02.00

ORDER SPECIFICATION PRICING PARTY:   ABRAHAMSONS (Potential Counterparty No 1)

DEFINED CIRCUMSTANCES ID:  31        COMMISSION RATE:  1.25%
                                     DISCOUNT RATE: 10.00% pa
                                     COMPONENT PRODUCT PRICES: see Column 3 below

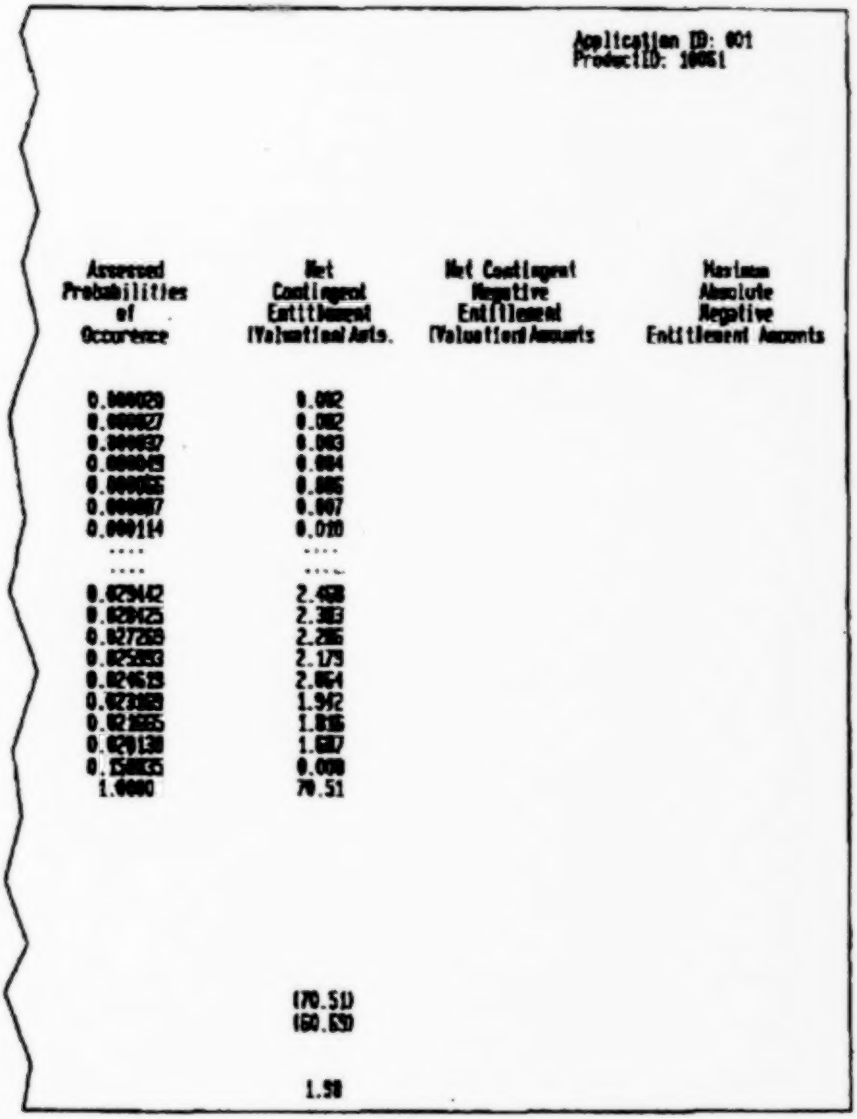

     Feasible              Net               Component            Implied
     Product            Contingent            Product            Contingent
    Definition          Entitlement           Prices             Entitlement
      Values              Amounts             [ID 31]              Amounts

        <                  0.00
       1600               83.83              0.000213              0.017
       1610               83.83              0.000211              0.018
       1620               83.83              0.000226              0.019
       1630               83.83              0.000228              0.019
       1640               83.83              0.000241              0.020
       1650               83.83              0.000281              0.024
       1660               83.83              0.000312              0.026
       ....               ....                 ....                 ....
       ....               ....                 ....                 ....
       2130               83.83              0.028127              2.358
       2140               83.83              0.028325              2.375
       2150               83.83              0.027320              2.290
       2160               83.83              0.026000              2.180
       2170               83.83              0.024010              2.009
       2180               83.83              0.023127              1.939
       2190               83.83              0.021436              1.797
       2200               83.83              0.020118              1.686
        >                 0.000              0.146620              0.000
                                             0.570600             63.07




Base Contract Bid Price(in Product Denomination terms):              (63.07)
Net Present Value (at 10.00% pa):                                    (59.45)
+ Flat Commission (1.25%)                                              0.74
= Contract Bid Price (in Product Denomination Terms):                (58.71)
Implied Base Margin on Contract:
```

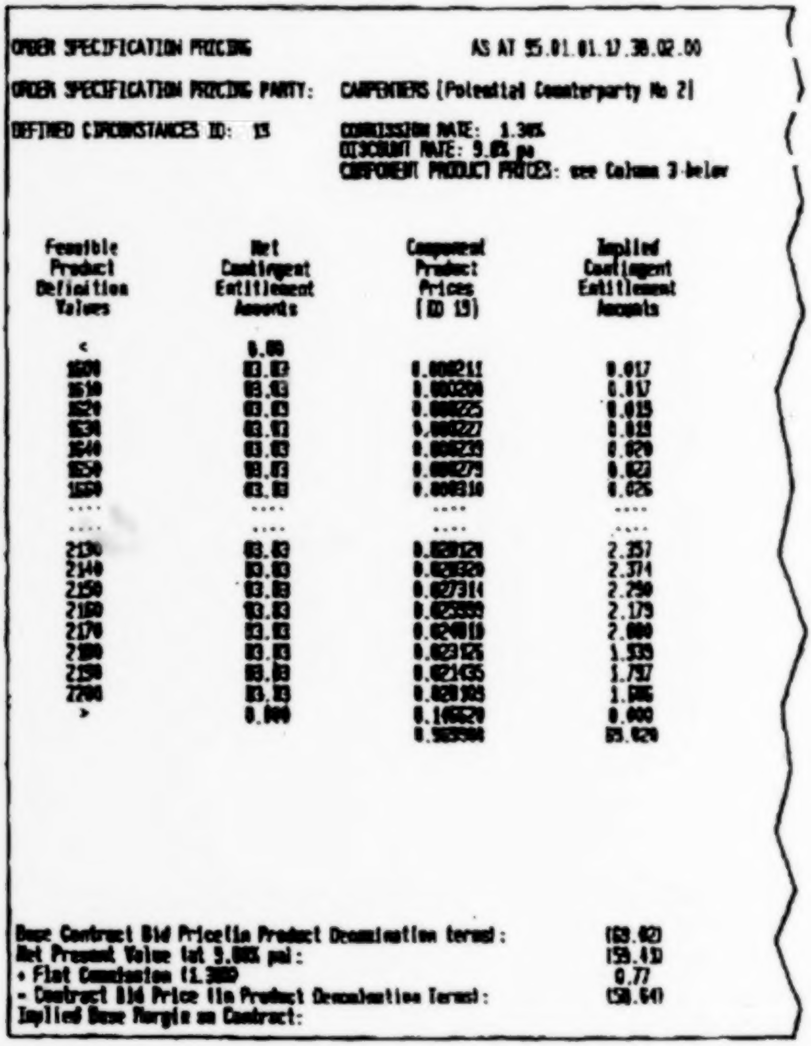
FIG. 76B



Application ID: 001
ProductID: 10061

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
0.000020	0.002		
0.000027	0.002		
0.000037	0.003		
0.000049	0.004		
0.000065	0.005		
0.000087	0.007		
0.000114	0.010		
....	....		
....	....		
0.029442	2.498		
0.028425	2.383		
0.027269	2.266		
0.025993	2.179		
0.024619	2.064		
0.023169	1.942		
0.021665	1.816		
0.020130	1.687		
0.150035	0.000		
1.0000	70.51		
	(70.51)		
	(60.63)		
	1.98		

FIG. 77A



```
ORDER SPECIFICATION PRICING                              AS AT 55.01.01.17.38.02.00

ORDER SPECIFICATION PRICING PARTY:   CARPENTERS (Potential Counterparty No 2)

DEFINED CIRCUMSTANCES ID:   13        COMMISSION RATE:  1.30%
                                      DISCOUNT RATE: 9.0% pa
                                      COMPONENT PRODUCT PRICES: see Column 3 below


     Feasible            Net               Component          Implied
     Product          Contingent            Product          Contingent
    Definition       Entitlement            Prices          Entitlement
      Values           Amounts              (ID 13)            Amounts

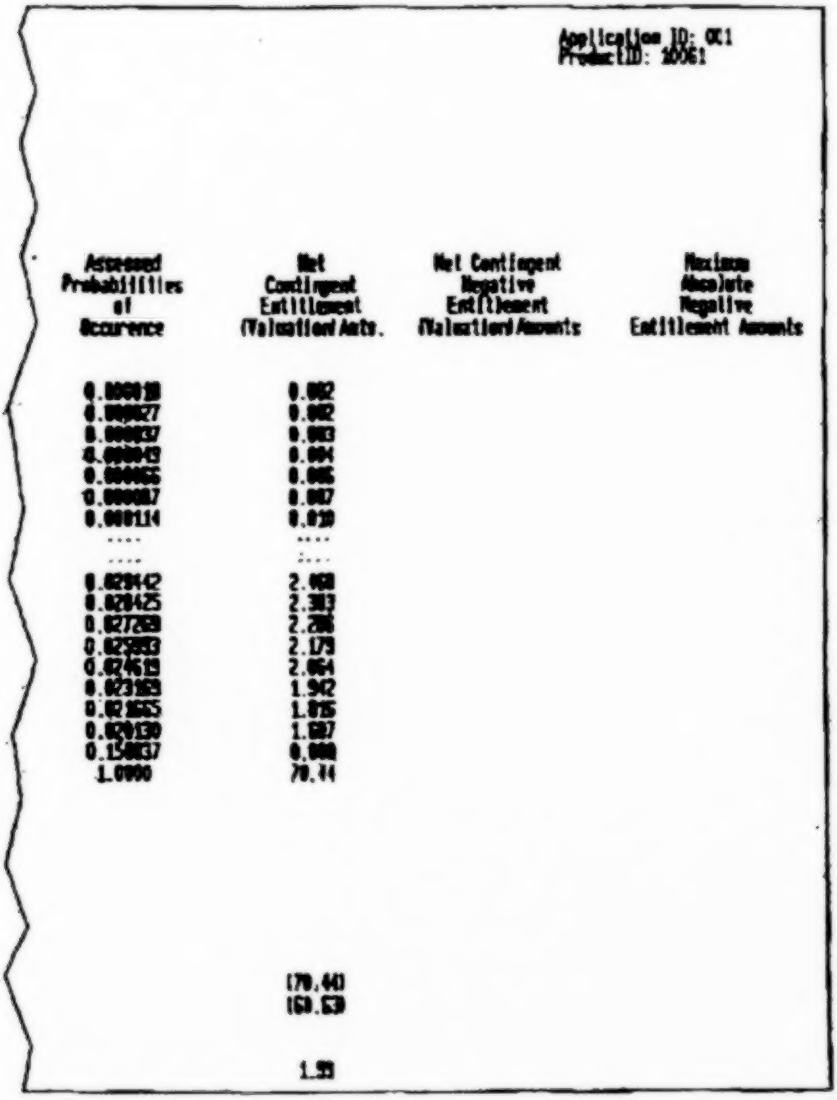
        <               0.00
      1600             83.83              0.000211            0.017
      1610             83.83              0.000208            0.017
      1620             83.83              0.000225            0.019
      1630             83.83              0.000227            0.019
      1640             83.83              0.000239            0.020
      1650             83.83              0.000279            0.023
      1660             83.83              0.000310            0.026
      ....             ....                 ....               ....
      ....             ....                 ....               ....
      2130             83.83              0.028129            2.357
      2140             83.83              0.028320            2.374
      2150             83.83              0.027314            2.290
      2160             83.83              0.025999            2.179
      2170             83.83              0.024018            2.000
      2180             83.83              0.023125            1.939
      2190             83.83              0.021435            1.797
      2200             83.83              0.020305            1.686
        >               0.000             0.146629            0.000
                                          0.585584           65.929





Base Contract Bid Price(in Product Denomination terms):          (69.02)
Net Present Value (at 9.00% pa):                                 (59.41)
+ Flat Commission (1.30%)                                          0.77
= Contract Bid Price (in Product Denomination Terms):            (58.64)
Implied Base Margin on Contract:
```

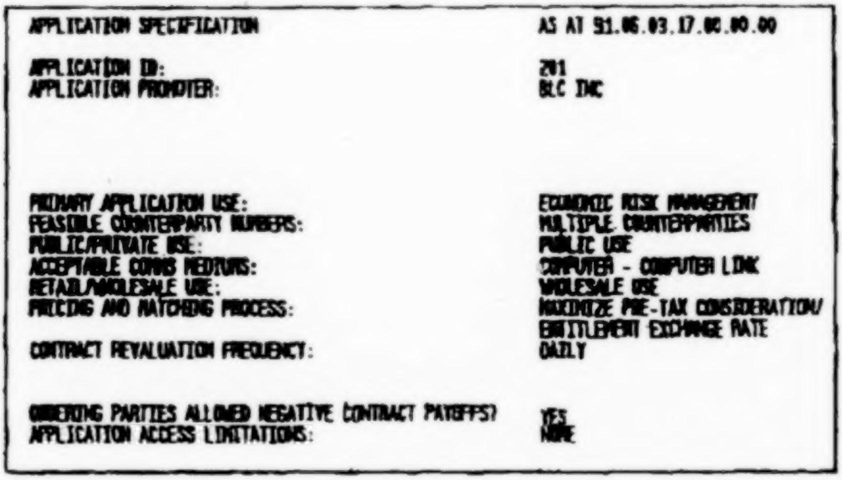
FIG. 77B



Application ID: 001
ProductID: 10061

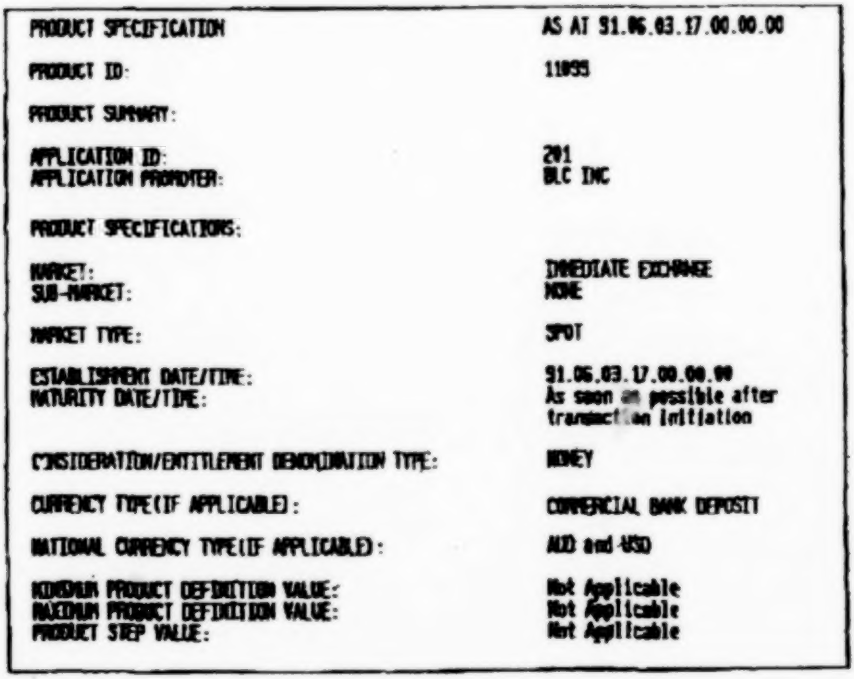
Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
0.000018	0.002		
0.000027	0.002		
0.000037	0.003		
0.000049	0.004		
0.000065	0.005		
0.000087	0.007		
0.000114	0.010		
....	....		
....	....		
0.029442	2.488		
0.028425	2.383		
0.027269	2.286		
0.025983	2.179		
0.024615	2.064		
0.023169	1.942		
0.021665	1.815		
0.020130	1.687		
0.150837	0.000		
1.0000	70.44		
	(70.44)		
	(60.53)		
	1.99		

FIG. 78



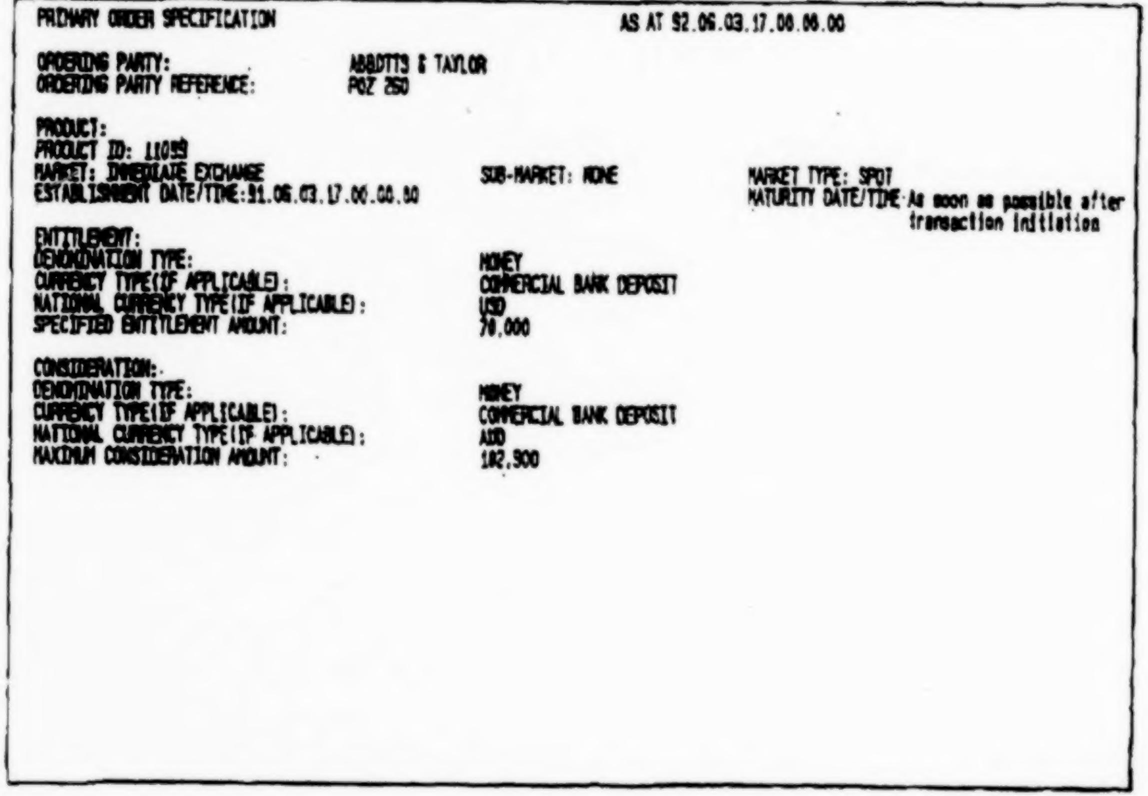
APPLICATION SPECIFICATION	AS AT 91.06.03.17.00.00.00
APPLICATION ID:	201
APPLICATION PROMOTER:	BLC INC
PRIMARY APPLICATION USE:	ECONOMIC RISK MANAGEMENT
FEASIBLE COUNTERPARTY NUMBERS:	MULTIPLE COUNTERPARTIES
PUBLIC/PRIVATE USE:	PUBLIC USE
ACCEPTABLE COMMS MEDIUMS:	COMPUTER - COMPUTER LINK
RETAIL/WHOLESALE USE:	WHOLESALE USE
PRICING AND MATCHING PROCESS:	MAXIMIZE PRE-TAX CONSIDERATION/ ENTITLEMENT EXCHANGE RATE
CONTRACT REVALUATION FREQUENCY:	DAILY
ORDERING PARTIES ALLOWED NEGATIVE CONTRACT PAYOFFS?	YES
APPLICATION ACCESS LIMITATIONS:	NONE

FIG. 79



PRODUCT SPECIFICATION	AS AT 91.06.03.17.00.00.00
PRODUCT ID:	11055
PRODUCT SUMMARY:	
APPLICATION ID:	201
APPLICATION PROMOTER:	BLC INC
PRODUCT SPECIFICATIONS:	
MARKET:	IMMEDIATE EXCHANGE
SUB-MARKET:	NONE
MARKET TYPE:	SPOT
ESTABLISHMENT DATE/TIME:	91.06.03.17.00.00.00
MATURITY DATE/TIME:	As soon as possible after transaction initiation
CONSIDERATION/ENTITLEMENT DENOMINATION TYPE:	MONEY
CURRENCY TYPE(IF APPLICABLE):	COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):	AUD and USD
MINIMUM PRODUCT DEFINITION VALUE:	Not Applicable
MAXIMUM PRODUCT DEFINITION VALUE:	Not Applicable
PRODUCT STEP VALUE:	Not Applicable

FIG. 80



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PRIMARY ORDER SPECIFICATION                                          AS AT 92.06.03.17.00.00.00

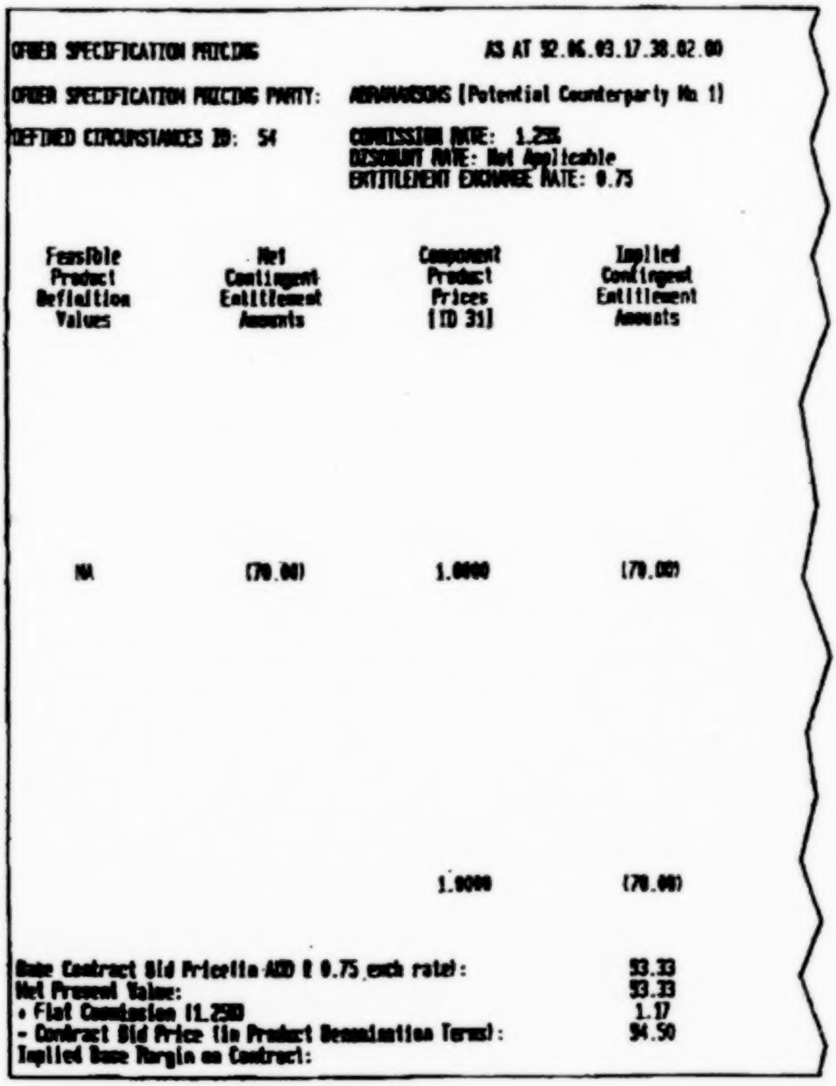
ORDERING PARTY:                   ABBOTTS & TAYLOR
ORDERING PARTY REFERENCE:         POZ 250

PRODUCT:
PRODUCT ID: 11059
MARKET: IMMEDIATE EXCHANGE                           SUB-MARKET: NONE          MARKET TYPE: SPOT
ESTABLISHMENT DATE/TIME:91.06.03.17.00.00.00                                   MATURITY DATE/TIME:As soon as possible after
                                                                                                  transaction initiation

ENTITLEMENT:
DENOMINATION TYPE:                                   MONEY
CURRENCY TYPE(IF APPLICABLE):                        COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):               USD
SPECIFIED ENTITLEMENT AMOUNT:                        70,000

CONSIDERATION:
DENOMINATION TYPE:                                   MONEY
CURRENCY TYPE(IF APPLICABLE):                        COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):               AUD
MAXIMUM CONSIDERATION AMOUNT:                        102,900
```

FIG. 81A



ORDER SPECIFICATION PRICING AS AT 92.06.03.17.38.02.00

ORDER SPECIFICATION PRICING PARTY: ABRAHAMSONS (Potential Counterparty No 1)

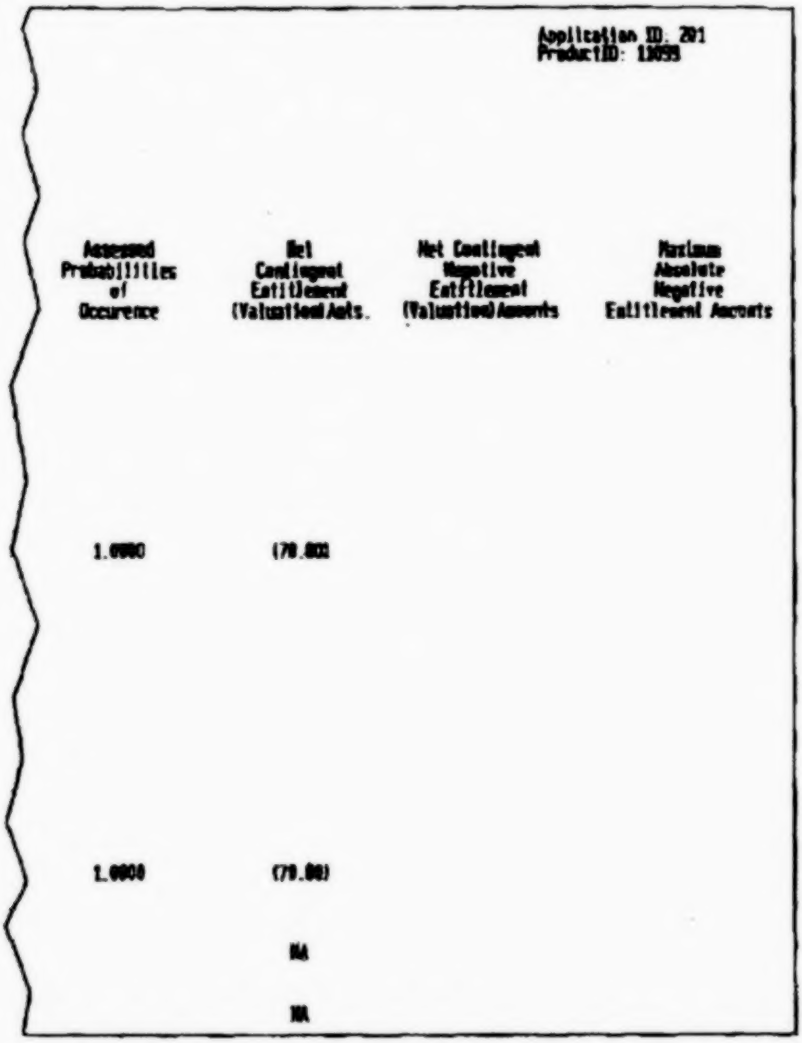
DEFINED CIRCUMSTANCES ID: 54

COMMISSION RATE: 1.25%
DISCOUNT RATE: Not Applicable
ENTITLEMENT EXCHANGE RATE: 0.75

Feasible Product Definition Values	Net Contingent Entitlement Amounts	Component Product Prices (ID 31)	Implied Contingent Entitlement Amounts
NA	(70.00)	1.0000	(70.00)
		1.0000	(70.00)

Base Contract Bid Price(in AUD @ 0.75 exch rate): 53.33
Net Present Value: 53.33
+ Flat Commission (1.25%) 1.17
- Contract Bid Price (in Product Denomination Terms): 54.50
Implied Base Margin on Contract:

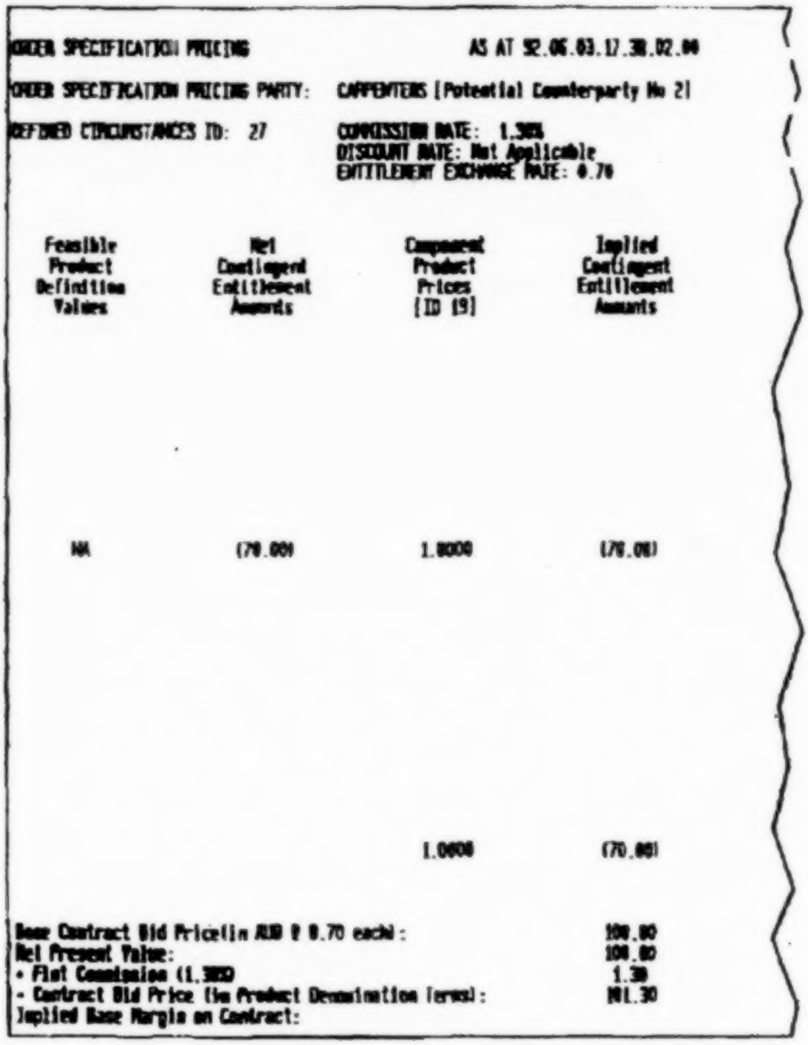
FIG. 81B



Application ID: 201
ProductID: 13099

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
1.0000	(70.00		
1.0000	(70.00)		
	NA		
	NA		

FIG. 82A



```
ORDER SPECIFICATION PRICING                              AS AT 02.06.03.17.30.02.00

ORDER SPECIFICATION PRICING PARTY:    CARPENTERS [Potential Counterparty No 2]

DEFINED CIRCUMSTANCES ID:  27         COMMISSION RATE:  1.30%
                                      DISCOUNT RATE: Not Applicable
                                      ENTITLEMENT EXCHANGE RATE: 0.70


    Feasible             Net              Component          Implied
    Product           Contingent           Product          Contingent
   Definition         Entitlement          Prices           Entitlement
     Values             Amounts            [ID 19]            Amounts



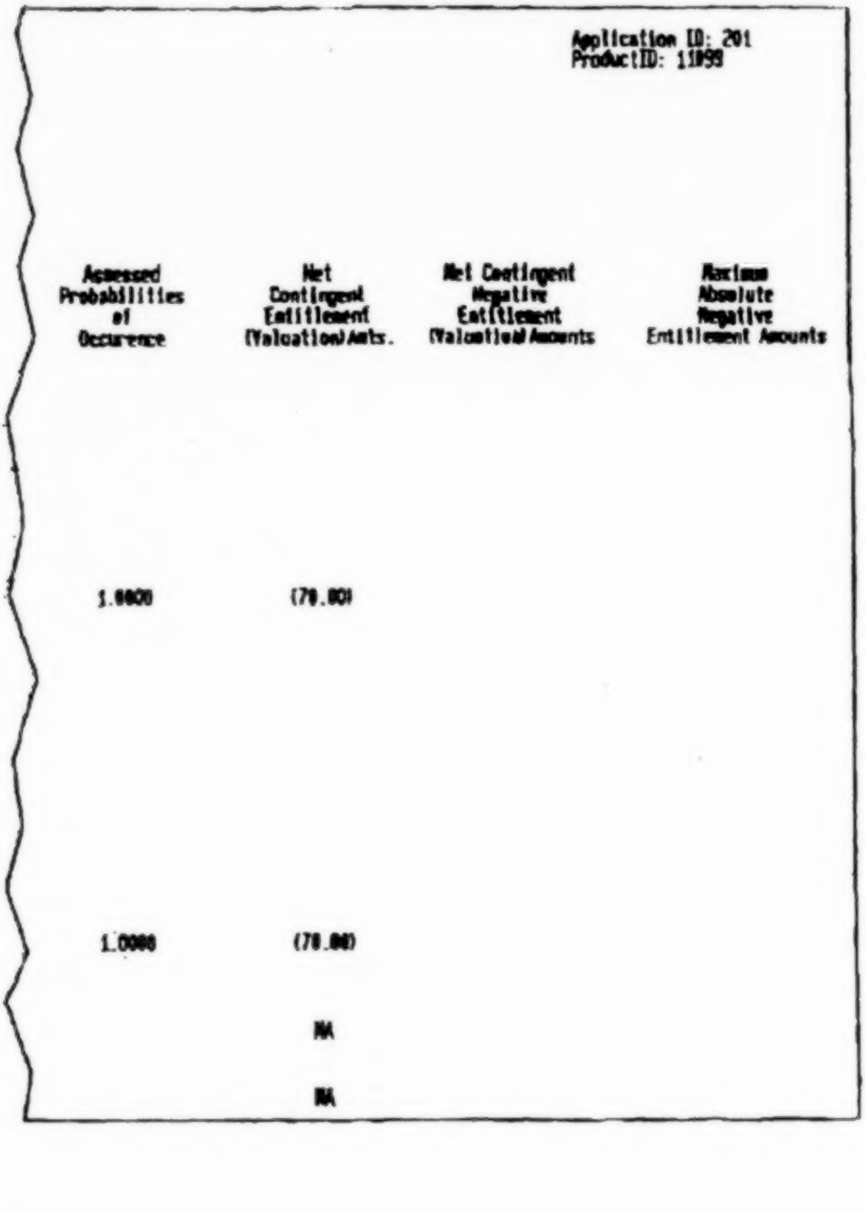

       NA               (70.00)            1.0000             (70.00)




                                           1.0000             (70.00)

Base Contract Bid Price(in AUD @ 0.70 each):                   100.00
Net Present Value:                                             100.00
+ Flat Commission (1.30%)                                        1.30
- Contract Bid Price (in Product Denomination Terms):          101.30
Implied Base Margin on Contract:
```

FIG. 82B



Application ID: 201
ProductID: 11099

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
1.0000	(70.00)		
1.0000	(70.00)		
	NA		
	NA		

SYSTEMS FOR EXCHANGING AN OBLIGATION

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a Continuation of application Ser. No. 09/567,507, filed May 9, 2000 now U.S. Pat. No. 6,912,510, which is a Continuation of U.S. application Ser. No. 08/870, 691, filed Jun. 6, 1997, now issued as US. Pat. No. 6,134, 536, which is a Continuation-In-Part of U.S. application Ser. No. 08/070,136, filed May 28, 1993, now issued as U.S. Pat. No. 5,970,479; said U.S. application Ser. No. 08/870,691 is also a continuation-in-part to International Application No. PCT/AU95/00827 filed Dec. 7, 1995, which designated the US. Both application Ser. No. 08/070,136 and PCT/AU95/ 00827 are incorporated by reference in their entireties herein.

TECHNICAL FIELD

This invention relates to methods and apparatus, including electrical computers and data processing systems applied to financial matters and risk management. In particular, the invention is concerned with the management of risk relating to specified, yet unknown, future events.

Background Art

Individuals and enterprises are continually exposed to risk because of future events beyond their control. The outcome of those events can either positively or negatively impact on their wellbeing.

Individuals and enterprises should generally prefer not to face exposure to the possibility of adverse consequences, regardless of their perception of the likelihood of such events occurring. It is in their interest to consider foregoing 'resources' they currently possess if doing so would reduce the possibility of being so greatly exposed to future outcomes.

Risk can take many forms in view of the large range and type of future events which might result in adverse consequences. Risk can be categorised, in one instance, as 'economic' in nature. Phenomena that constitute economic risk include: commodity prices, currency exchange rates, interest rates, property prices, share prices, inflation rates, company performance, and market event based indices.

Another characterisation of risk concerns 'technical' phenomena. This can include things like the breakdown of an electricity generation plant, aircraft engine failure, and the damage to, or failure of, orbiting telecommunications satellites. The outcomes for each of these phenomena will be adverse for the users and/or supplier.

Other forms of risk defy ready characterisation, such as weather-based (viz., rain damage or lightning strike), or other natural occurrences (viz., earthquakes or iceberg collision with seagoing vessels).

There are also less tangible risks associated with, for example, the emission of atmospheric pollutants or the disposal of intractable toxic wastes, in the sense that the future consequences are unknown, save that there is a notion, based on current information, that they could be adverse.

The capability to manage risk is more important today than it was in the past and is likely to become evermore important into the future, because them is an ever increasing exposure to a wider generic range of future phenomena beyond the control of individuals or enterprises. There is also a wider feasible range of possible future events, and greater uncertainty about the likelihood of occurrence, associated with any single future phenomenon viz., an increasing volatility.

It is also thought that individuals are now more risk-averse in recessionary times, when there are fewer available discretionary resources to trade-off to protect themselves from such adverse future events.

In the prior art, individuals and enterprises faced with 'technical' risk have hedged against future outcomes by mechanisms such as the adoption of quality assurance practices, warranties, increased research and development activity (and associated intellectual property rights such as patents, utility models and registered designs), the purchase of modernised plant and equipment, and improved inventory, occupational health and safety and employer/employee relations practices.

Consider a manufacturer of say, integrated circuits (ICs), which has many clients wishing to purchase its ICs. The demand may result in a delay in delivery due to limited manufacturing capacity, thereby requiring advance production scheduling for orders already in-hand. Typically, the manufacturer will give a warranty to a purchaser as to measurable performance criteria for its ICs; if a batch does not perform to the specified criteria, the manufacturer is required by contract to replace that batch. That is, a purchaser may have no interest in obtaining monetary compensation for the poor quality ICs, as the purchaser needs the components for their own products. In that case, the 'consideration' the warranty makes is the priority scheduling of a substitute batch of that type of IC, possibly displacing other scheduled production runs, or deferring delivery to another purchaser.

Such contractual arrangements are piece-meal in nature, and can only be struck between the manufacturer and each individual purchaser. They also leave the manufacturer exposed to claims from other customers whose orders are delayed by the rescheduling. The manufacturer has no convenient mechanism available to it to hedge against such claims, perhaps by way of reserving production rights with another manufacturer, in lieu of unavailability of their own manufacturing facility.

In the face of such 'economic' risk, it is known for individuals and enterprises to hedge against adverse outcomes by indirect means such as self-insurance, and directly by means such as futures contracts, forward contracts, and swaps.

There are disadvantages or limitations associated with such available economic risk management mechanisms. Particularly, they provide, at best, only indirect approaches to dealing with the risk management needs. The available mechanisms are relatively expensive, and provide limited phenomenon coverage, and therefore cannot meet the requirements of the party seeking to hedge against such wide-ranging future risk. The infrastructure and pay-out costs associated with switching between, say, a commodities market and a stock market are often prohibitive for entities small and large alike. As a consequence, entities find themselves saddled with obligations they have little control over and cannot escape.

In respect of the "less tangible" forms of risk, an example in the prior art of a form of management of that risk is that of 'pollution rights' sold by the U.S. Environmental Protection Agency (EPA) in March 1993 for the atmospheric emission of sulphur dioxide. This was done by an auction of "allowances" permitting the release into the atmosphere. By the year 1995, any company or organisation emitting sulphur dioxide in the U.S. without enough allowances to cover their total emissions will face prosecution. This means polluters must either buy further allowances, or else modify or replace their plant and equipment to reduce these emissions. The EPA will regulate the total number of allowances able to be obtained. The existing allowances have already become a valuable tradeable 'property' as between sulphur dioxide emitters, that is, even before the time when no further allowances will be able to be purchased.

Management techniques for the "less tangible" forms of risk are in their infancy. The existing forms indicate an emerging demand for systems and methods to enable effective management.

Specific examples in the prior art of patents relating to methods and apparatus which deal with various forms of risk management include British Patent No. 2 180 380, in the name of Merrill Lynch Pierce Fenner and Smith Incorporated, directed to an Automated Scurities Trading Apparatus (corresponding to U.S. Pat. No. 4,674,004, and further related to U.S. Pat. Nos. 4,346,442 and 4,376,978). Other examples include U.S. Pat. No. 4,739,478 assigned to Lazard Freres and Co., directed to Methods and Apparatus for Restructuring Debt Obligations, U.S. Pat. No. 4,751,640 assigned to Citibank, N.A., directed to An Automated Investment System, and U.S. Pat. Nos. 4,752,877, 4,722,055, and 4,839,804 assigned to

College Savings Bank directed to Methods and Apparatus for Funding Future Liability of Uncertain Cost.

The present invention comes about in view of the shortcomings of existing risk management mechanisms, and the perceived increasing importance of the management of risk relating to specified, yet unknown, future events.

In this sense, the invention is directed to something having economic value to individuals, enterprises and societies as a whole. Methods and apparatus that provide for the management of risk offer material advantages by, for example, minimising adverse future outcomes, providing both a form of compensation in the event of adverse future outcomes, and forms of risk management not otherwise supported or available in the prior art, and thus have value in the field of economic endeavour.

DISCLOSURE OF THE INVENTION

The invention encompasses methods and apparatus enabling the management of risk relating to specified, yet unknown, future events by enabling entities (parties) to reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent on the occurrence of the specified future events. The entities submit such orders to a 'system' which seeks to price and match the most appropriate counterparty, whereupon matched contracts are appropriately processed through to their maturity.

Therefore, the invention enables parties to manage perceived risk in respect of known, yet non-predictable, possible future events. These future events may relate to measurable phenomena whose outcome is verifiable, and cannot be materially influenced by any other entity having a stake in that outcome.

The ability to price and match risk aversion contracts essentially comes about because of the nature of risk itself. Any number of people will each have differing views as to the likelihood of an outcome of some future event. This means that when each person is required to independently assess a range of outcomes for a specified future date, there almost always will be a variance in those assessments. Thus it is possible to match these expectations as between parties to form a contract. The potential counter-parties to an offered contract have the motivation of taking up an opportunity to exploit differing views of future outcomes to their advantage, either for some gain or, again, as a form of risk management.

It is important that the assessments as to future outcomes of events are made independently of any other party who could be a counter-party to a contract. The nature of the pricing and matching, therefore, is totally different to conventional negotiation or bidding as between parties.

The present invention enables entities to better manage risk, as they are able to think more explicity about possible future events beyond their control which they perceive will have adverse consequences for them. They will have the capacity to utilise existing resources to reduce exposure to a specific risk, and have access to a generally available mechanism by which they can explicity trade-off existing assets for increased certainty about the future. They are also free to decide upon the degree to which they should make such trade-offs, and to actually effect and subsequently manage such trade-offs in a simple and low cost manner.

Risk management contract formulation comprising the steps of order placement, pricing and matching. An ordering party initiates contract formulation by submitting an order that relates to a specified phenomenon that has a range of possible outcomes relative to a future date of maturity. The ordering party specifies elemental entitlements (payouts) due at maturity relative to the phenomenon's actual outcome, and a maximum consideration to be paid to a counterparty on matching of a contract. Independently, potential counterparties have submitted registering data based on their assessed probability of each possible outcome at maturity for the phenomenon in question. From this counterparty registering data, a data processing system then seeks to price each counterparty against the ordering party's specified entitlement. Broadly speaking, this involves multiplying each of the elemental ordering party entitlements with the corresponding counterparty probability and summing the results to derive counter considerations. The counter considerations must fall below the ordering party's maximum consideration for there to be the possibility of a match. Most usually a match will be made between the ordering party and the counterparty having the lowest counter consideration.

The ordering stakeholders and counter-party stakeholders can be considered to be contract buyers and contract sellers respectively. The entitlement for each outcome can be in the form of 'money' payoffs (both positive and negative) at maturity of a matched contract, or can be other types of compensation, possibly in the form of goods, services, promises, credits or warrants. The consideration, whether buyer specified or seller calculated, can again be in the nature of a premium or payments, or can relate to other 'non-money' forms of property or obligations, typically transferable when a contract is matched, although possibly deferable, until, and potentially beyond, the time of maturity.

In the period between the match of a contract and maturity the various buyers, sellers and other contract stakeholders can review any contract to which they are a party and seek to trade that contract to other parties by the pricing and matching procedure, or variations on the pricing and matching procedure. They would tend to do so if their view of the future outcome of the phenomenon, being the subject of the contract, had changed markedly, or as a means to minimise expected losses if some unforseen adverse trend in the present day outcome of the phenomenon has occurred. As well as trading existing contracts, further contracts can be offered to 'lay off' or avert risk. Stakeholder parties can build up a portfolio of matched contracts and offered contracts, which are continually traded to obtain the best possible position at any time, and that position can be continually reviewed with time.

It is further possible for offered contracts to be based on the difference between phenomena, and so manage perceived risk as between the phenomena. Elemental contract phenomena can therefore be developed to meet the most particular needs of buyers and sellers, thus creating great flexibility.

In most instances the date of maturity will be predetermined by a 'product sponsor' stakeholder, who otherwise cannot be a buyer or seller of contracts they sponsor. Even so, it is conceivable that the date of maturity can be tied to a specified time from the instant a contract is matched. This may be appropriate where the time of maturity is in the near future, in which case offered contracts could otherwise remain unmatched following initial offer even up until the time of maturity.

Other stakeholders have executive roles in administration, guaranteeing the performance of buyers and seller, regulation, supervision and so on. In this way the number and types of buyers and sellers that can be considered in pricing and matching offered contracts can be controlled.

The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement.

In another preferred form, the invention provides that the phenomenon for an offered contract is specified such that the elemental entitlements for the range of outcomes are the same for each outcome. In mathematical terms this corresponds to a shape in an x-y cartesian coordinate system where entitlement value (y) with respect to the outcome values (x) is a flat line. Put another way, the entitlement vs. outcome (y,x) shape has zero gradient ($\Delta y/\Delta x$). This type of entitlement/outcome shape can be thought of as a form of lending (if the entitlement is positive, or borrowing if the entitlement is negative), in that the ordering party wishes to make the consideration available for lending now, having the expectation of receiving a known (non-contingent) entitlement in the future. Contract pricing and matching with a counter-party can proceed as described above.

Embodiments of the invention significantly advance the state-of-the-art of formulating and trading risk management contracts. Essentially, this is achieved by a computing/telecommunications infrastructure that is capable of being accessed worldwide by any enterprise/individual having access to a computer and telephone network. Furthermore, a virtually infinite number and range of risk typescan be accommodated. One embodiment presents itself in a form that assists users in making consideration-entitlement (insurance-type) trade-off decisions and provides a blind yet transparent price-discovery and trading process. Through its capability to create special case lending/borrowing and exchange products, end users are also provided with a low-cost mechanism for pricing and acquiring these products without the involvement of traditional intermediaries.

The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement. Therefore, in accordance with a further aspect of the invention, there is disclosed a method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of: (a) creating a shadow credit record and debit record for each party to be held independently from the exchange institutions by a supervisory institution; (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and debit record; (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusts each respective party's shadow credit record or debit record, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and (d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

BRIEF DESCRIPTION OF THE DRAWINGS

A number of embodiments of the invention will now be described with reference to the accompanying drawings, in which:

FIG. 1 shows a block diagram of a generic 'system' embodying the invention;

FIG. 2a shows a schematic block diagram of an indicative hardware platform supporting the system of FIG. 1;

FIG. 2b is a schematic block diagram of an alternate hardware platform supporting the system of FIG. 1;

FIG. 3 shows a representation of INVENTCO and its main component parts;

FIG. 4 shows a block diagram of a subset of the components of an INVENTCO system's markets-depository (M-INVENTCO);

FIG. 5 shows a block diagram of the process components of a subset of one type of 'market' (termed CONTRACT APP) which can reside within M-INVENTCO;

FIG. 6 shows a timeline applicable to Example I;

FIG. 7 shows a timeline applicable to Example II;

FIGS. 8 to 16 show flow diagrams of the contract pricing and matching methodology;

FIG. 17 shows a timeline applicable to Example III; and

FIGS. 18 to 40 show flow diagrams of the first to ninth process components for a CONTRACT APP; and

FIG. 41 shows a timeline for Example IV;

FIG. 42 shows a timeline for Example V; and

FIGS. 43A to 82B show tables and charts associated with Examples I, II, III, IV, and V.

DETAILED DESCRIPTION OF A BEST MODE FOR CARRYING OUT THE INVENTION

1. Introduction

The description firstly discusses the relation of the various users (stakeholders) of the 'system', followed by a consideration of a hardware data processing platform and peripheral input/output devices by which stakeholders interact with each other and the system.

This is followed by a discussion of the scope of the 'applications' that can be supported by the system in relation to the various stakeholders, and the interrelation of component parts thereof.

Details as to software methodologies for implementation of the applications supported by the system are also described, including a number of worked examples relating to the formulation and trading of risk management contracts.

In the course of the detailed description reference is made to a number of non-conventional expressions and terminologies. For convenience, an explanation of these is listed in the Glossary hereinbelow.

2. 'Systems' Configurations

FIG. 1 shows a block diagram of a generic 'system' embodying the invention. The various stakeholders or parties to the system 10 each have access to a centralised processing unit 20. The processing units 20 can be constituted by one or more data processing apparatus, with each one thereof providing access for any one or more of the various stakeholders to applications software supported by the system 10, as all the processing units would be interconnected. Access to the one or more data processing apparatus is controlled by a generic form of communications coordination and security processing unit 25.

FIG. 1 also indicates that there are a number of types of stakeholder, and a number of individual stakeholders within each stakeholder type. The basic types of stakeholder are described as: applications promoters 11, product sponsors 12, product ordering parties (buyers) 13, potential product counter-parties (sellers) 14, counter-party guarantors 15, regulators 16, consideration/entitlement transfer ('accounting') entities 17, and miscellaneous parties 18. The detailed roles of each of these stakeholders will be subsequently described in greater detail at a later time. The number of types of stakeholder represented in FIG. 1 is typically the largest that will be supported by the system 10.

An embodiment of a computer system for the system 10 is shown in FIG. 2. The core of the system hardware is a collection of data processing units. In the embodiment described, the processing unit 20 comprises three interlinked data processors 93, 97, 104, such as the Sun 670 MP manufactured by Sun Microsystems, Inc. of the USA. Each processing unit 93, 97, 104 runs operational system software, such as Sun Microsystems OS 4.1.2, as well as applications software. The applications software is, in part, written around the flow diagrams subsequently described in FIGS. 8 to 16, and FIGS. 18 to 40, and accesses, or otherwise creates, the data files as summarized in the section headed PROCESS 2 VARIABLES AND DATA FILES hereinbelow. The processor configuration shown in FIG. 1 represents a large system designed to handle the transactions of thousands of stakeholders, the input and output data generated by those stakeholders, and risk management contact pricing, matching and subsequent processing functions.

Each processing unit 93,97,104 is operably connected with it one or more mass data storage units 95, 100,110 to store all data received from stakeholders, and other data relating to all other software operations generating or retrieving stored information. Suitable mass storage units are, for example, such as those commercially available from Sun Microsystems.

A number of communications controllers 80,84,87, forming the communications coordination and security processing unit 25, are coupled with the processing unit 20. These controllers effect communications between the processing units 93,97,104 and the various external hardware devices used by the stakeholders to communicate data or instructions to or from the processing units. The communications controllers are such as the Encore ANNEX II, the IBM AS/400 server or the CISCO Systems AGS+.

A large range of communications hardware products are supported, and collectively are referred to as the stakeholder input/output devices 70. One amongst many of the communication devices 70 are personal computers 51 and associated printers 52, which have communications connection with the communications controller 80 by means of a modem 50. There can also be an external host device 53, such as a mini or mainframe computer, again linked with the communications controller 80 by means of a modem 54. In other forms, communications can be established simply by means of a tone dialing telephone 56, which provides for the input of instructions or data by use of the tone dialing facility itself. In the alternative, a voice connection via an operator 75 can be effected by a conventional telephone 58. Both these external devices are shown connected with the communications controller 84. A further possibility is to have data transfer by means of a facsimile machine 65, in this case shown linked to the communications controller 87.

In all cases, users of the input devices are likely to be required to make use of system access password generation and encryption devices such as the Racal RG 500 Watchword Generator 66, 67,68,69, (for personal use) and the Racal RG 1000, which is incorporated in a mainframe computer 53. The corresponding decoding units for these devices are incorporated in the communications controllers 80,84,87.

The generic processing unit 20 also includes a large number of 'portable' information recordal devices, such as printers, disc drives, and the like, which allow various forms of information to be printed or otherwise written to storage media to be transferable. This is particularly appropriate where confirmatory documentation of matched risk contracts is required to be produced, either for safekeeping as a hard copy record, else to be forwarded to any one or more of the stakeholders that are a party to each individual matched contract.

The generic system 10 shown in FIG. 1 encompasses many varied configurations, relating not only to the number and types of stakeholders, but also the 'architectures' realisable by the system hardware and software in combination. In that sense the arrangement shown in FIG. 2a is to be considered only as broadly indicative of one type of hardware configuration that may be required to put the invention into effect.

For example, FIG. 2b shows an alternative configuration that does not rely upon a centralised (hub) data processing unit, rather the necessary processing is performed locally at each stakeholder site 200n by means of distributed software.

The 'virtual' level of the system 10 is termed INVENTCO. INVENTCO is a collection of one or more potentially interrelated systems, as shown in FIG. 3. Each INVENTCO system (INVENTCO SYSTEM #1 . . . INVENTCO SYSTEM #N) enables the formulation and trading of a wide range of contractual obligations, including risk management contracts. The hardware configuration shown in FIG. 2, is to be understood both as a realisation for a single INVENTCO system, and equally can represent a number of INVENTCO SYSTEMS, where the processing unit 20 is common to all and supports a number of communications coordination and security units 25, others of which are not shown, together with associated external communications devices 70, also not shown.

While INVENTCO allows the formulation and trading of risk management contracts, it is also responsible for processing of such contracts through to, and including, their maturity, and in some respects, subsequent to maturity.

Where there are a number of INVENTCO systems, those systems may be interdependent or stand-alone in nature. If interdependent, INVENTCO (10) is responsible for transactions between those systems.

INVENTCO and all of its component parts can be legally or geographically domiciled in separate countries or states. The supranational nature of INVENTCO enables the stakeholders to avail themselves of the risk management mechanisms independently of legal domicile or other such restrictions that are often a feature of some conventional risk management mechanisms, subject to meeting certain criteria regarding credit worthiness and such. Indeed, the legal domicile, location, ownership and participating stakeholders of INVENTCO, or any of the subsystems, can be continually changing.

FIG. 3 further shows that each INVENTCO SYSTEM comprises an infrastructure component, termed I-INVENTCO, and a markets depository component M-INVENTCO. I-INVENTCO is concerned with co-ordination of communications and other security considerations, that part termed AXSCO, and also provides a network and general management system, termed VIRPRO. M-INVENTCO is a depository of authorised product-market (applications) software residing within INVENTCO under the authorisation of VIRPRO, and as distributed using I-INVENTCO.

One or more local or wide area telecommunication networks may link VIRPRO and M-INVENTCO to AXSCO, and thus to each other. In this way both VIRPRO and M-INVENTCO effectively reside around AXSCO.

AXSCO therefore comprises multiple, uniquely addressed communications controllers linked together in a number of possible ways. In one embodiment, AXSCO is represented by the communications co-ordination and security processing unit 25 shown in FIG. 2. The component hardware, such as the three controllers 80, 84,87 shown in FIG. 2, typically are responsible for three types of operational applications. The first is in respect of time stamping data received from other parts of INVENTCO and data similarly transmitted to entities external of INVENTCO. The second is in respect of protecting the identity and/or location of entities within INVENTCO from one another, and from entities external to INVENTCO. The third is responsible for overall management of the routing of data received and to be transmitted within INVENTCO and to external entities thereto.

Referring now to FIG. 4, within M-INVENTCO reside different collections of system sponsored phenomena or 'markets', one collection of which is termed CONTRACT APPS. Each CONTRACT APP within the CONTRACT APPS 'markets' collection is essentially related to a specific type of risk management phenomenon. The purpose of individual CONTRACT APPS is two-fold. First, to effect the trading/exchange/transfer of risk management contracts (and derivatives of these transactions) between participating product ordering parties and counter-parties on terms acceptable to the parties involved, as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trades/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through to their time of maturity.

Individual CONTRACT APPS are responsible for performing the above-described tasks according to the specific rules they embody, defined by their applicable stakeholders.

The role played by the various stakeholders to CONTRACT APPS, remembering that in many cases it would not be necessary to have the involvement of all the possible types of stakeholder, briefly stated is as follows:

(a) An application promoter is an entity having overall responsibility for the functioning of a CONTRACT APP, having being granted that responsibility by VIRPRO.

(b) A product sponsor is an entity which promotes and administers the rules of trading, and subsequent management of defined "products" selected for inclusion in a CONTRACT APP by its application promoter.

(c) An ordering party (buyer) is an entity seeking to acquire a CONTRACT APP product from a potential counter-party (seller).

(d) A counter-party (seller) is an entity potentially prepared to satisfy the CONTRACT APP product needs of an ordering party (buyer).

(e) A guarantor is an entity guaranteeing a seller's ability to settle or meet obligations as a result of a CONTRACT APP effected match.

(f) Regulators are entities overseeing the ongoing performance of all other stakeholders involved in a CONTRACT APP, and especially guarantors.

(g) Consideration/entitlement transfer ('accounting') entities are those parties with which all other CONTRACT APP stakeholders maintain 'accounts' to transfer required considerations/ entitlements to or from each other.

(h) Other miscellaneous parties are those having some other defined stake in the functioning of a CONTRACT APP. In any implementation of the system, multiple numbers of each form of stakeholder are accommodated. A detailed consideration of the nature of CONTRACT APPS and the types of stakeholders to a CONTRACT APP is given in the section headed CONTRACT APPS hereinbelow.

As shown in FIG. 5, any one CONTRACT APP consists of a cluster of nine (and potentially more, or fewer) specific processes, these include:

(a) a process handling file administration and updating tasks supporting all other processes (termed Process 1);

(b) a process handling the receipt and processing of "primary" risk aversion contract transactions (termed Process 2);

(c) a process handling the receipt and processing of "secondary" risk aversion contract transactions (termed Process 3);

(d) a process handling the receipt and processing of "derivative-primary" risk aversion contract transactions (termed Process 4);

(e) a process handling the receipt and processing of "derivative-secondary" risk aversion contract transactions (termed Process 5);

(f) a process handling the "back office" management of all four types of risk aversion contract transactions, and transactions handled by Processes 7 to 9 (termed Process 6);

(g) a process handling non-CONTRACT APP-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7);

(h) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to specialist systems to assist the stakeholder concerned to decide how best to interface with a defined element of INVENTCO (termed Process 8); and

(i) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to a range of INVENTCO-facilitated "value added services" (termed Process 9).

A detailed discussion of the nine CONTRACT APP processes given in the section headed DESCRIPTION OF CONTRACT APP PROCESSES hereinbelow.

All these processes collectively access multiple data files and multiple records within these files. A description of the variables and data files used by Process 2, a key component process of a CONTRACT APP, is provided in the section headed PROCESS 2 VARIABLES AND DATA FILES hereinbelow.

The foregoing description identifies the essential interreaction between the hardware platform and the applications computer software run thereon.

A first example of the life-cycle of a risk management contract will now be described. A further detailed discussion of the nature of risk management contracts is given in the section headed RISK MANAGEMENT CONTRACTS hereinbelow.

3. Life Cycle of Risk Management Contract: Example I

The first example of a risk management contract describes a contract to manage risk associated with faults in microprocessors. In summary, the example shows how the system could enable one party, such as a supplier of military standard equipment seeking to avoid the adverse consequences of faulty microprocessors (specifically, 64-bit microprocessors) used in that equipment to make a contract with another party, such as a manufacturer of these microprocessors, who is seeking to exploit an opportunity based on their view of the future incidence of faults in the microprocessors they produce.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to "exclusive production warrants" (XPWs). That is, warrants providing the holder with priority access to a specified quantity of replacement and additional microprocessors sourced, immediately, from a defined, different, guaranteed high-quality, production line available to the supplier in consideration of payment of a money amount. The XPW entitlement is contingent on the value, at contract maturity date, of a percentage index of the proportion of 64-bit microprocessors shipped by the manufacturer, during a specified prior period, which are subsequently determined to be faulty to a defined degree. The defined degree, in this case, is the microprocessor being fault-free, as determined by successful completion of self-tests.

In this example, the relevant key stakeholders are: an application promoter (Demdata Inc); various product sponsors (the relevant one for the example being Demdata Inc itself); various primary product ordering parties (the relevant one for the example being Denisons); a single potential counterparty (Demdata Inc again); and an application regulator (the Department of Defence).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 6. FIGS. 43A–50B are eight detailed explanatory charts supporting FIG. 6. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 43A and 43B, it can be seen that Demdata Inc. established a Contract APP (Application ID 100) on 92.02.10.17.00.00 (that is, in inverse order, 5 pm on Feb. 10, 1992) to deal with defect liability management. Application ID 100 supports a range of products (Applicable Product ID's 1200-1250).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 44A and 44B, it can be seen that Demdata was also Product Sponsor of Product 1210 at the same time (92.02.10.17.00.00). This Product relates to the market termed: Factory Output Quality Indices, and to the sub-market termed 64-bit Microprocessor Fault Tolerance Index. The maturity date for Product 1210 is 95.02.10.17.00.00.00. The consideration for a specific contract involving Product 1210 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is in the form of Exclusive Product Warrants (XPWs); these entitle the contract ordering party to priority access over the forward production capacity of a defined, guaranteed-high-quality, 64-bit microprocessor production line. Product 1210 specifies a range of 0% to 100% in 2% increments in respect of the sub-market outcomes.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), it can be found that Demdata is acting as the sole potential counterparty for forthcoming primary product orders dealing with Product 1210. At this point in the timeline (93.07.01.14.00.00.00), 17 months after the specification of Product 1210, Demdata has currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with FIGS. 45A and 45B, it can be seen that an Ordering party, Denisons, is seeking a contract (from the offering party, Demdata) in Product 1210 at that time (93.07.01.14.25.30.00). FIGS. 45A and 45B show the specific "pay-off" parameters that Denisons has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration (premium) amount of 32,000 (denominated in commercial bank, Australian dollars).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 46A and 46B, it can be seen that Demdata (using the specified pricing parameters set at (93.07.01.14.00.00.00) prices the Denison order 93.07.01.15.26.40.00. Demdata's pricing parameters indicate that their appropriate Defined Circumstances ID for Denisons is 14. As is shown, this ID in turn implies a Commission Rate of 1.10%, a Discount Rate of 9.90%, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence over the range of feasible product values (outcomes).

The Contract Bid Price is calculated automatically by the application software in the following manner: The ordering party-specified desired contingent entitlement amounts, i.e. the "registered data", (covering the feasible product definition value range) are multiplied by the potential counterparty-specified component product prices (which will rarely add to "1" because each counterparty is endeavouring to 'game' potential ordering parties in different ways) to yield the corresponding number of implied contingent entitlement amounts. When added together, these figures sum to (34.110), where the brackets signify a negative value. This figure represents an expected future counterparty-entitlement payout amount (as at the designated contract maturity date of 95.02.10.17.00.00). The present day value of this figure, calculated using the specified discount rate of 9.90% per annum, is 29,220. To this amount is added the potential counterparty's desired flat commission amount of 1.10%, yielding a contract Bid Price (in the consideration/entitlement denomination of the product, commercial bank-denominated Australian dollars) of 29,540. No exchange rates are applicable in this case, because the ordering party, Denisons, is not seeking to deal in a consideration or entitlement denomination different to the denominations formally specified for the product. Demdata's parameters calculate that a consideration bid price of 29,540 will yield them a base margin on the contract of 3,180 (again denominated in commercial bank, Australian dollars).

This margin amount is calculated in the following manner: The ordering party-specified desired contingent entitlement amounts (covering the feasible product definition value range) are multiplied by the potential counterparty-specified assessed probabilities of occurrence to yield a corresponding number of net contingent entitlement valuation amounts. When added together, these sum to (30.770). This amount represents an expected future counterparty-entitlement loss-on the contract (as at the designated contract maturity date of 95.02.10.17.00.00). The present value of this amount, calculated using the specified discount rate of 9.90% per annum, is 26,360. Thus, (ignoring for this example the margin Demdata may gain from using, in some manner, the consideration amount of 29,540 through to the time the contract expires, and various transaction fees) the margin

Demdata can expect from entering into this contract with Denisons is their calculated present-value indifference price of 29,540 less their calculated present-value expected loss on the contract of 26,360 (or 3,180).

The amounts in the last two rows of the table of FIGS. 46A and 46B are used for checking that this contract, if entered into by Demdata, will not result in them violating any self imposed portfolio valuation or composition limits. This notion is explained in detail in Example III.

Looking at the sixth step in the timeline (Order Matching), it can be found that Demdata's contract bid price of 29,540 is below Denison's specified maximum consideration price of 32,000, leading to a matching of the order at 93.07.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be seen to take place twelve minutes later at 93.07.01.14.38.50.00, after the system has determined that Denisons is able to (and then does) immediately pay the required consideration funds amount of 29,540 to Demdata.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 47A and 47B, it can be seen that a contract valuation report for Denisons was published not much longer than one hour after confirmation of the contract, that is, at 93.07.01.16.00.00.00. As can be seen, the market estimate of the future product value of the 64BMFT Index at this moment is 38 (with a standard deviation of 4), which implies that this contract has an expected future value of 29,330 XPWs (with a standard deviation of 6,213).

On FIGS. 48A and 48B it can be seen the equivalent report for Demdata Inc. of their expected future entitlement payout is identical to Denisons' expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts). The above-described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The ninth step in the timeline (Contract Valuation) refers to a contract valuation report published for Denisons sixteen months later, at 94.11.15.10.00.00.00 (see FIGS. 49A and 49B). As can be seen, the market estimate of the future product value of the 64 BMFT Index at this moment is 58 (with a standard deviation of 5), which implies that this contract now has an expected future value of 42,160 XPWs (with a standard deviation of 6,209). This is an increase in expected future value of 12,830 XPWs for Denisons since the former valuation date/time.

The tenth step in the timeline, Contract Maturity, refers to the actual determination of the product value at time of maturity, 95.02.10.17.00.00.00. As can be seen on FIGS. 50A and 50B, this product value of the 64 BMFT Index was specified by Demdata (as Product Sponsor) to be 74, implying a contract value of 100,660 XPWs to Denisons and a corresponding obligation on Demdata. The amount of 74 represents the percentage of 64-bit microprocessors shipped by Demdata, during a specified period some time before the designated contract maturity date, which are subsequently determined (possibly by the application regulator, The Department of Defence) to be faulty.

The eleventh step in the timeline involves the formal assignment of 100,660 XPWs by Demdata to

Denisons (ignoring possible fee payments by one or both parties).

4. Life Cycle of Risk Management Contract: Example II

The second example describes a risk management contract associated with the utilisation of telecommunications carrying capacity. In summary, the example shows how the system could enable one party (a telecommunications carrier) seeking to avoid the adverse consequences of under and over-committing their call carrying capacity between specified points (say, between the two cities, New York and Boston) to make a contract with another party (say, another telecommunications carrier with call carrying capacity between the same two cities) similarly prepared to hedge against the consequences of this occurring.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to transmission time units between the hours 1200–1800 daily on the NY-Boston link within a defined future period (termed, Prime TTU's) upon assignment by the ordering party—to the counterparty—of a calculated consideration amount of Prime TTUs on the ordering party's own NY-Boston line within another defined future period (these defined TTUs may or may not be convertible to TTUs on other city links). The TTU entitlement is contingent on the value, at contract maturity date, of the log of the difference between the ordering party's utilisation of the counterparty's network and the counterparty's utilisation of the ordering party's network, during a specified prior period ending on the contract maturity date.

In this example, the relevant key stakeholders are: an application promoter (Newcom Inc); various product sponsors (the relevant one for the example being

Newcom Inc itself); various primary product ordering parties (the relevant one for the example being Basstel Co.); two potential counterparties (Tasnet and Aarcom); and an application regulator (ITT).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 7. FIGS. 51A–59B are nine detailed explanatory charts supporting FIG. 7. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 51A and 51B, it can be seen that Newcom Inc. established a Contract APP (Application ID 001) on 93.11.01.17.00.00 (that is, 5 pm on Nov. 1, 1993) to deal with hardware capacity management. Application ID 001 supports a range of products (Applicable Product ID's 2001-2020).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 52A and 52B, it can be seen that Newcom Inc. was also Product Sponsor of Product 2001 at the same time (93.11.01.17.00.00). This Product relates to the market termed Telecommunications Carrying Capacity and to the sub-market termed Prime TTUs. The maturity date for Product 2001 is 96.11.01.17.00.00.00. The consideration for a specific contract involving Product 2001 is in the form of "Ordering Party TTUs". The entitlement is in the form of "Counterparty TTUs"; these entitle the contract ordering party to "transmission time units between the hours 1200-1800 daily on the NY-Boston link (within a defined future period)". The feasible values of PRIME TTUs are normalized in the range of 1.0 to +1.0, respectively signifying the proportionate utilization of respective networks as between the parties to a contract.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two other carriers, Tasnet and Aarcom, acting as potential counterparties for forthcoming primary product orders dealing with Product 2001. At this point in the timeline (94.06.01.14.00.00.00), 7 months after the specification of Product 2001, both Tasnet and Aarcom have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with FIGS. 53A and 53B, it can be seen that an Ordering Party, Basstel Co., is seeking a contract, from an offering party, in Product 2001 at that time (94.06.01.14.25.30.00). FIGS. 53A and 53B show the specific parameters (entitlements) that Basstel Co. has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 58,000 (denominated in its own TTUs).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 54A and 54B, it can be seen that Tasnet (using the specified pricing parameters set at 94.06.01.14.00.00.00) prices the Basstel Co. order at 94.06.01.14.26.40.00. Tasnet's pricing parameters indicate that their appropriate Defined Circumstances ID for Basstel Co. is 8. As is shown, this ID in turn implies a Commission Rate of 1.00%, a Discount Rate of 9.90% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example 1, this results in a Contract Bid Price of 55,180 (denominated in Basstel Co. TTUs), which Tasnet's parameters calculate will yield them a base margin on the contract of 10,760 (again denominated in Basstel Co. TTUs).

Still looking at the fifth step in the timeline, in conjunction with FIGS. 55A and 55B, it can be seen that Aarcom (again using the specified pricing parameters set at 94.06.01.14.00.00.00) also prices the Basstel Co. order at 94.06.01.14.26.40.00. Aarcom's pricing parameters indicate that their appropriate Defined Circumstances ID for Basstel Co. is 9. As is shown, this ID in turn implies a Commission Rate of 0.90%, a Discount Rate of 8.50% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results in a Contract Bid Price of 55,390 (denominated in Basstel Co. TTUs), which Aarcom's parameters calculate will yield them a base margin on the contract of 9,430 (again denominated in Basstel Co. TTUs).

Looking at the sixth step in the timeline (Order Matching) it can be found that Tasnet's price bid of 55,180 is below Aarcom's bid of 55,390 and, in turn, that the 55,180 amount is below Basstel Co.'s specified maximum consideration price of 58,000. This leads to a formal matching of Basstel Co,'s order by Tasnet at 94.06.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be seen to take place nearly ten seconds later at 94.06.01.14.38.50.00, after the system has determined that Basstel Co. is able to (and then does) immediately assign the required consideration amount of 55,180 TTUs to Tasnet.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 56A and 56B, one can see a contract valuation report for Basstel Co. published about two hours after confirmation of the contract, that is, at 94.06.01.16.00.00.00. As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet's network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.150) (with a standard deviation of 0.023), which implies that this contract has an expected future value of 54,236 Tasnet TTUs (with a standard deviation of 9,207). On FIGS. 57A and 57B one can see in the equivalent report for Tasnet that their required expected future entitlement payout is identical to Basstel Co.'s expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Contract Valuation) refers to a contract valuation report published for Basstel Co. five months later, at 94.11.22. 10.00.00.00 (see FIGS. 58A and 58B). As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet's network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.400) (with a standard deviation of 0.010), which implies that this contract now has an expected future value of 350,181 Tasnet TTUs (with a standard deviation of 74,200). This is an increase in expected future value of 295,945 TTUs for Basstel Co. since the former valuation date/time.

The tenth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 96.11.01.17.00.00.00. As can be seen on FIGS. 59A and 59B, this product value of TTU's was specified by Newcom Inc (as Product

Sponsor) to be (0.400), unchanged from the prior valuation date/time, implying a contract value of 368,340 Tasnet TTUs to Basstel Co. and a corresponding obligation on Tasnet. The amount is higher than the prior valuation figure due to the actual determination figure being naturally without a standard deviation element.

The eleventh step in the timeline involves the formal assignment of the 368,340 TTUs by Tasnet to Basstel Co. (ignoring possible fee payments by one or both parties).

5. Primary Product Order Processing

Before describing the third, and most detailed, example, consideration will be given to the 'core' product (contact) ordering, pricing and matching processes. Note that expressions such as (PORD NEW) represent file names.

The flow charts in FIGS. 8 to 16 depict the processing flow of the matching system for primary product orders submitted by ordering party stakeholders to a CONTRACT APP, where this APP is based upon: an EV-CE counterparty pricing regime (assuming paid consideration amounts do not yield an income stream in their own right); a sequential order matching process; consideration/entitlement value dates which are immediately after a product sponsor-designated date/time; and matching rules which do three things: First, identify, for each ordering party's order, a counterparty offering the lowest price bid for an order, subject to this price being at or below the specified maximum price the ordering party has indicated it is prepared to pay. Second, accommodate portfolio expected loss constraints on an 'equivalent maturity date products', 'same-month maturity products', and 'all-products' basis. And third, apply the above-described matching rules on a pretax basis, with partial matching of product orders, and without conditional order matching rules.

As shown in FIG. 8, starting at block 610, and proceeding to block 625, the system determines which set of orders to process, authorises these orders, matches them with counterparties where possible, and then confirms them. As shown in blocks 1010 to 1070 in FIG. 9, the system holds newly submitted orders (PORD NEW), and all previously submitted, but as yet unmatched, orders which are defined as queued orders (PORD QUEUE). Parameters and algorithms can be implemented to give the system the ability to determine whether new or queued orders are to be processed at any time. For example, a simplistic algorithm would be to alternate between PORD NEW and PORD QUEUE one order at a time. Another example would be to load queued orders only when there is a change in the counterparty parameters. Test 1020 checks the decision made in block 1010.

For new orders, the system moves to block 1030. Details of the next recorded new order are loaded from the PORD NEW master file (block 1040). The order data fields include: the ordering party identification (BID); the ordering party's own reference (BREF); the product identification (PID) specified by the ordering party; the entitlement "payoff" function type (PAYFUNC); the parameters for the entitlement "pay off" function (PAYPARAM); a "deal type" identifier (DTID); the anonymous and manual deal identifiers (OANON and OMANUAL); the order retention time limit (RET LIM); the maximum consideration the ordering party is prepared to pay (MAXCONSID); the number of the account from which the consideration is to be "paid" (ACC CONSID); and the number of the account to which any entitlement "pay off" amount is to be paid (ACC ENTITL). With this information set, the system's next step is to authorise the order. This occurs at block 1050.

Order Authorisation

Blocks 1100 to 1162 in FIG. 10 provide an expansion of block 1050. Starting at block 1100 the order is assigned a unique identification, which is set in the order data field OID. Before verifying the order, additional information is required by the system. At block 1110, details of the product (order data field PID) are loaded from the master file PPRODUCT (block 1120). The information includes the product maturity date (PMAT); the product consideration/entitlement denomination (PC/ED); the product currency denomination (PCUR) and national currency denomination (PNCUR); and the product limits and parameters (PMIN, PMAX, and PSTEP). The test 1130 checks that the order parameters are consistent with the master file parameters implied by the defined product identification (PID). Orders which fail this test are rejected at block 1140, with details of these orders being stored in the master file PORD REJ (block 1150). In turn, the ordering party is informed of this event (block 1160). Processing then returns to the start of the flow chart (block 1010), ready to load the next order. When an order is authorised, processing continues at block 640.

In the case of a queued order being loaded (block 1060), the order fields are set using the details stored in the queue file PORD QUEUE (block 1070). This data is a combination of new order data (as described in block 1030) and the data loaded/set when the order was originally verified (block 1110). Authorised order processing continues with the order matching process at block 640.

Order Matching

Blocks 1200 to 1616 in FIGS. 11 to 15 provide an explanation of block 640. Orders have retention time limits, stored in the order variable RET LIM. Test 1200 checks that the order retention time has not expired. If it has, the order is rejected at block 1210, with the order details copied to the rejected order file (PORD REJ). The ordering party is then informed of the rejection at block 1230, and processing returns to the main loop via connector "A". If the order is still valid, the order matching process proceeds. The aim now is to find a suitable counterparty (or counterparties) who "prices" the ordering party's "entitlement function" within the limits set by the ordering party. Starting at block 1240, the matching process described is one which seeks to identify, for each ordering party's order, a counterparty offering the lowest "price bid" for an order subject to this price being at or below the specified maximum "price" the ordering party has indicated it is prepared to pay.

Blocks 1300 to 1370 in FIG. 12 provide an explanation of block 1240. The first step is to narrow down a group of counterparties prepared to at least deal with the ordering party. This is described as obtaining the available counterparty short list. First the counterparty short list is wiped (block 1300). Next, the order data fields BID (ordering part identification) and PID (product identification) are used to search the PDEAL LIST master file (block 1320) for all counterparties prepared to consider dealing with the ordering party in the specified product. Any stakeholders who have set a MANUAL or ANON flag are also loaded. For each counterparty selected, SID is set to the corresponding identification. Test 1330 commences a loop which allows every counterparty available to be dealt with in turn. For any currently selected counterparty (with identification set in SID), the data flow proceeds to test 1365. Where the order data field OANON has been set by the ordering party and some stakeholder requires manual confirmation (MANUAL (SID)), the current potential counterparty is not included in the short list. Likewise if the ordering party set OMANUAL and some other stakeholder required anonymity (ANON (SID)). In both cases, data flow returns to test 1330. Otherwise, flow continues at block 1335. At this point, the system determines the applicable "defined circumstances" for the order. It uses the order data fields currently loaded and parameters set in the PSEL DC masterfile (block 1336) to determine this. At block 1340, pricing parameters including consideration/ entitlement exchange rates (if applicable), commission rates, and discount rates are selected from the PSEL PRICE master file (block 1350). Using the "defined circumstances" identification (set in DCID) all potential counterparties can have different sets of pricing parameters specified based on any of the order data fields of each order. Test 1360 checks that all the necessary parameters have been found. It is possible that the counterparty, though prepared to deal with the ordering party, does not have a complete set of pricing parameters for the current order specifications. Such a counterparty is not included in the counterparty short list, and processing returns to test 1330. At block 1370, the counterparty is added to the counterparty short list by including the pricing details in the variables: PRICEFUNC(SID), CR(SID), DR(SID), C-C/EDXCHANG(SID), C-CXCHANG(SID), C-NCXCHANG(SID), E-C/EDEXCHANG(SID), E-CXCHANG(SID), E-NCXCHANG(SID), MANUAL

(SID), and ANON(SID). Processing then returns to test 1330 where the next selected potential counterparty is dealt with. When all selected potential counterparties have been processed, program flow returns to block 1250. At this point a potential counterparty short list has been obtained.

Blocks 1400 to 1550 in FIGS. 13 and 14 depict block 1250 in more detail, where every potential counterparty has its price offer calculated, based on their individual pricing parameters, for the currently loaded order. At block 1400 a loop commences allowing each potential counterparty in the potential counterparty shortlist to be dealt with in turn. SID is set to the identification of the counterparty currently selected. Test 1410 checks whether any counterparties are left for processing. At block 1420, the potential counterparty's price bid is calculated. Blocks 1490 to 1550 describe this calculation in more detail. At block 1490 the variable, INDEX, is assigned the starting value of the product value range (PMIN). Also, "price" is initialised to zero. Test 1500 commences a loop, where every index point in the product range is traversed. Block 1520 calculates the pricing value returned by the potential counterparty's pricing function, PRICEFUNC, as stored in (PRICEFUNC (SID)), at the current index point, and stores the value in P1. Block 1530 determines the pay-off amount required by the ordering party at the current index point and stores this value in P2. At block 1540, the total price at the current index point is calculated by multiplying P1 by P2. This value is added to the running total stored in PRICE(SID). At block 1550, the index counter (INDEX) is incremented by the product step size (PSTEP), and flow returns to the test 1500. When the end of the product range has been reached (PMAX), flow proceeds to block 1510, where the calculated price bid is modified by the following calculation:

PRICE(SID)=PRICE(SID)*E-C/EDXCHANG(SID)
*E-CXCHANG(SID)*E-NCXCHANG(SID).

Returning to block 1430, the price bid stored in PRICE(SID) will be in the applicable product's consideration/entitlement denomination, currency denomination, and national currency denomination. The following steps (block 1430-1470) determine and apply the applicable discount rate to the calculated price bid (currently in future value terms) to yield a price bid in present value terms. This is done as follows: At block 1430 the number of days to product maturity is determined. Block 1440 initialises the loop counter and discount rate divisor. For each day (or appropriate part thereof) between the current date/time and the product maturity date/time, the divisor is changed according to the formula (block 1460):

DIV=DIV*(1+((DR(SID) / 100) / 365))

At block 1470, the price bid is adjusted according to the formula:

PRICE(SID)=PRICE(SID)/DIV

Once the price bid in present value terms is known, the potential counterparty's defined commission is added to the price (block 1480). Given that CR(SID) is a percentage commission rate, the formula is:

PRICE(SID)=PRICE(SID)+((CR(SID)/100)*PRICE(SID))

When test 1410 confirms that every potential counterparty has been priced, program flow continues at 1255.

The test at 1255 checks whether the order was a "quote only" order. If so, flow continues at block 1256 where one or more of the counterparty bid prices are selected. At block 1230, the ordering party is informed of the pricing information gathered. If the order was not a quote order (that is, it was a real product order), an attempt is now made to identify a counterparty from the potential counterparty short list matching the requirements of the current order. This is done at block 1260. Blocks 1560 to 1616 in FIG. 15 describe this process in detail.

Starting at test 1560, a check is made to ensure the potential counterparty shortlist is not empty. If it is, no match is possible and flow continues at block 1612. At this point SID is assigned "0" to indicate that no counterparty was selected from the potential counterparty short list, before moving to block 1614 where the entire order (as no part was matched) is queued. When the list is not empty, program flow continues at block 1570, where the lowest priced counterparty is selected from the counterparty short list. This determination is done based upon each potential counter-party's bid price (PRICE(SID)), being converted to the consideration/entitlement type, currency, and nation-al currency consideration "payment" denominations sought by the ordering party (that is, PRICE(SID)= PRICE(SID)*C-C/EDXCHAN G(SID)*C-CXCHANG(SID)*C-NCXCHANG(SID)). The counterparty identification is stored in SID, and its price offer is stored in BPRICE. At block 1580, the following check is made:

BPRICE>MAXCONSID

If the selected price is greater than the ordering party's specified maximum consideration payment (MAXCONSID) limit, a match with the current potential counterparty is not deemed possible. This must also be true for any of the remaining counterparties in the counterparty short list. This part of the matching process returns without any potential counterparty in the short list having been selected for a match (block 1612). Otherwise, the current price is acceptable, and the process proceeds to attempt a match with the current selected counterparty.

The next step (block 1590), requires all the applicable contract, product, and portfolio absolute loss, expected loss, expected value limits, and maximum composition limits to be read from the PSEL LIMIT master file (block 1600) and stored in ALL 1(SID), ALL2(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), EVL1 (SID), MC(SID) and MCC(SID). The current absolute and expected losses accumulated are also read and stored in CAL2 (SID), CEL2 (SID), CEL3(SID), CEL4(SID), and CEL5(SID).The ELFUNC(SID) and EVFUNC(SID) values are also set for use when calculating the expected loss and expected value for the current order. Block 1602 calculates the price of the order entitlement function using the counterparty product expected loss and expected value parameters ELFUNC(SID) and EVFUNC(SID). The order's expected loss is stored in EL(SID); the order's expected value is stored in EV(SID). The absolute loss function is also determined at block 1602 and it is stored in AL(SID). Proceeding to block 1604, the portion of the order which will not violate the counterparty limits is calculated. This check is made at test 1606. If no part of the order is matched, process flow continues at block 1608. The potential counterparty is removed from the counterparty shortlist.

If some portion of the order is matched with the current counterparty, processing continues at block

1610. Here the SID is set to the identification of the matching counterparty. The unmatched portion (if any) is stored at block 1614 as a new order in the PORD QUEUE masterfile (block 1616). Flow then returns to test 1261 in FIG. 1. When a match occurs, program flow returns to block 650. The matched order must now be confirmed by carrying out a number of additional steps, as shown in FIG. 16, blocks 1620 to 1641. If no match occurred, processing of the current order steps, and program flow returns to the beginning via connector "A". The system is ready to load the next available order.

Matched Order Confirmation

For matched orders to become a contract, a number of additional actions are required. First, at test 1620, a check for manual authorisation is made. If required, program flow moves to block 1621 where authorisation requests are sent to the relevant stakeholders. Block 1623 then tests the replies for any rejections. If one or more rejections were received, program flow continues at block 1627 where the order is rejected. Otherwise, flow continues at 1624. Block 1624 effects the consideration payment by creating transactions in the payment shadow file (PAYACC SHADOW—block 1625). However, this may fail if the accounts specified do not exist or if at least the required consideration amount is shown not to be available. Test 1626 checks that "consideration payment" was effected successfully. If "consideration payment" fails, the matched order is rejected (block 1627), with details stored in the rejected order master file, PORD REJ (block 1628). The ordering party is then informed of this event at block 1640.

With successful payment, program flow proceeds to block 1630 where the counterparty's current accumulated absolute and expected loss figures are updated (masterfile PSEL LIMIT—block 1631). At block 1632, the order data field OPRICE is set to the price given by the counterparty PRICE(SID), and SPRICE set to the counterparty's identification, SID. At block 1634, the matched order is certified as confirmed, with full details recorded in the masterfile PORD CONF (block 1636). The next step, block 1638, reports details of the newly created contingent contract to all stakeholders concerned. Program flow then returns to the beginning, via connector "A". The system is now ready to start processing the next order submitted by a specified ordering party.

6. Life Cycle of Risk Management Contract: Example III

The third example of a risk management contract describes a contract to manage risk associated with potential future movements in the value of a specified index of share prices (termed the PTSE 75 index). In summary, the example shows how the system could enable one party (such as an institutional fund manager) seeking to avoid the adverse consequences of a significant decline in the future value of the PTSE 75 index (specifically a decline by June 1996, relative to the assumed current (June 1991) value of the index) to make a contract with another, as-yet-unknown, party, such as another fund manager seeking to avoid the adverse consequences of a significant corresponding increase in PTSE 75 index value.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to a compensatory Australian dollar future payout upon payment of a calculated up-front consideration money amount by the ordering party to the as-yet-unknown counterparty. The future money entitlement is contingent on the value, at contract maturity date, of the independently-determined value of the PTSE 75 index.

In this example, the relevant key stakeholders are: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself); various product ordering parties (the relevant ones for the example being Abbotts & Taylor and Shearer & Associates); various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc); a counterparty guarantor (CNZ Banking Corporation); and an application regulator (the Pacific Central Bank).

The timeline depicting the steps in the contract from the first step (Application Specification) to the final step (Contract Settlement) is shown in FIG. 17. FIGS. 60A to 72B are thirteen detailed explanatory charts supporting FIG. 17. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 60A and 60B, it can be seen that BLC Inc established a Contract APP (Application ID 001) on 91.06.03.17.00.00 (that is, 5 pm on Jun. 3, 1991) to deal with economic risk management. Application ID 001 supports a range of products (Applicable Product ID's 10020-11400).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 61A and 61B, it can be seen that BLC Inc was also Product Sponsor of Product 10061 at the same time (91.06.03.17.00.00). This Product relates to the Market termed Stock Indices and to the Sub-market termed PTSE 75.

The maturity date for Product 10061 is 94.06.03.17.00.00.00. The consideration for a specific contract involving Product 10061 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is also in the form of commercial bank deposits denominated in Australian dollars, payable (if necessary) immediately after the Product's specified maturity date/time.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two entities, Abrahamsons and Carpenters Inc, acting as potential counterparties for forthcoming primary product orders dealing with Product 10061. At this point in the timeline (95.01.01.17.00.00.00), 19 months after the specification of Product 10061, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification), in conjunction with FIGS. 62A and 62B, it can be seen that an Ordering Party, Abbotts & Taylor, is seeking a contract, from an offering party, in Product 10061 at that time (95.01.01.17.37.06.00). FIGS. 62A and 62B show the specific parameters (entitlement) that Abbotts & Taylor has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 54,000 (denominated in commercial bank, Australian dollars).

In order to provide a more detailed explanation of the following fifth to seventh steps in the timeline, selected processing block numbers from FIGS. 8-16 will be referred to in brackets as follows: "[ ]".

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 63A and 63B, it can be seen that Abrahamsons' specified pricing parameters, as set at 95.01.01.17.37.06.06 are used to price the Abbotts & Taylor order at 95.01.01.17.38.02.00. Abrahamsons' pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 26. As is shown, this ID in turn implies a Commission Rate of 1.25%, a Discount Rate of 10.00% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example 1, this results in a Contract Bid Price of 51,920 (denominated in commercial bank, Australian dollars), which Abrahamsons' parameters calculate will yield them a base margin on the contract of 4,580 (again denominated in commercial bank, Australian dollars).

Still looking at the fifth step in the timeline, in conjunction with FIGS. 64A and 64B, it can be seen that Carpenters Inc specified pricing parameters, as set at 95.01.01.17.37.06.00, are also used to price the Abbotts & Taylor order at 95.01.01.17.38.02.00. Carpenters Inc's pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 17. As is shown, this ID in turn implies a Commission Rate of 1.30%, a Discount Rate of 9.80% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results in a Contract Bid Price of 53,050 (denominated in commercial bank, Australian dollars), which Carpenters Inc's parameters calculate will yield them a base margin on the contract of 5,610 (again denominated in commercial bank, Australian dollars).

Again, still looking at the fifth step in the timeline, in conjunction with FIGS. 65A and 65B, it can be seen that Abrahamsons' pricing-related parameters (also set at 95.01.01.17.37.06.00) for determining the acceptability of ordered-contracts on the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are satisfied by Abbotts & Taylor's order. From Abrahamsons' perspective, this qualifies Abbotts & Taylor's order for inclusion in their product/contract portfolio, as long as Abrahamsons' consideration price bid turns out to be lower than Carpenters Inc's price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, in its order specification (FIGS. 62A and 62B), it is prepared to pay.

Finally, still looking at the fifth step in the timeline, but now in conjunction with FIGS. 66A and 66B, it can be seen that Carpenters Inc's pricing-related parameters (set at 95.01.01. 17.37.06.00) for determining the acceptability of ordered-contract oil the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are also satisfied by Abbotts & Taylor's order. Now, from Carpenters Inc's perspective, this qualifies Abbotts & Taylor's order for inclusion in their product/contract portfolio, in this case, as long as Carpenters Inc's consideration price bid turns out to be lower than Abrahamsons' price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, in its order specification (FIGS. 62A and 62B), it is prepared to pay.

Looking at the sixth step in the timeline (Order Matching), it can be found that Abrahamsons' price bid of 51,920 is below Carpenters Inc's bid of 53,050 and, in turn, that the 51,920 amount is below Abbotts & Taylor's specified maximum consideration price of 54,000. This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons' at 95.01.01.17.38.07.00 [1260].

The seventh step in the timeline (Order/Contract Confirmation) takes place five seconds later at 95.01.01.17.38.11.00, after the system has determined that Abbotts & Taylor is able to (and then does) immediately pay the required consideration funds amount of 51,920 to Abrahamsons [650].

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 67A and 67B, one can see a contract valuation report for Abbotts & Taylor published nearly six hours after confirmation of the contract, that is, at 95.01.01.23.00.00.00. As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1970 (with a standard deviation of 333), which implies that this contract has an expected future value of 53,000 commercial bank-denominated Australian dollars (with a standard deviation of 21,160). On FIGS. 68A and 68B one can see in the equivalent report for Abrahamsons that their required expected future entitlement payout is identical to Abbotts & Taylor's expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Secondary Order Specification), detailed on FIGS. 69A and 69B, occurs nearly six months after the above-described contract valuation event; that is, at 95.06.06.08.00.00.00. At this time, Abbotts & Taylor is seeking to sell its position in the contract which was matched/confirmed at 95.01.01.17.38.11.00 (and at that time assigned the

Order ID of 9156515800 by the system) at a price better than 57,000. Shearer & Associates is prepared to pay 60,000 (commercial bank deposit-denominated Australian dollars) for this position. In all other respects the contract's attributes remain unchanged. On FIGS. 70A and 70B, the tenth step in the timeline, a contract sale is seen to have occurred at a price of 58,300, just below the above-described 60,000 upper limit purchase-price amount specified by Shearer & Associates. This amount is the current best estimate of the contract's expected future value, with the standard deviation of this expected future value calculated by the system, utilizing other recent transaction data, as being 10,610. Shearer & Associates has now formally taken the place of Abbotts & Taylor as a stakeholder to the contract.

The eleventh step in the timeline (Contract Valuation) refers to a contract valuation report published for Shearer & Associates seven months later, at 96.01.01.17.00.00.00 (see FIGS. 71A and 71B). As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1300 (with a standard deviation of 283), which implies that this contract now has an expected future value of 162,360 commercial bank deposit-denominated Australian dollars (with a standard deviation of 35,160). This is an increase in expected future value of 104,060 for Shearer & Associates since the former valuation date/time. The above described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The twelfth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 96.06.03.17.00.00.00. As can be seen on FIGS. 72A and 72B, this product value of the PTSE Index was specified by BLC Inc (as Product Sponsor) to be 1820, implying a contract value of 187,200 (commercial bank deposit-denominated Australian dollars) to Shearer & Associates, and a corresponding obligation on Abrahamsons. The figure of 1820 represents the actual value of the PTSE share price index at 96.06.03.17.00.00.00 as obtained by BLC Inc from the independently verifiable information source, the identity of which they would have disclosed at the time they first announced their sponsorship of trading in the PTSE 75 share index product.

The thirteenth step in the timeline involves the formal payment of 187,200 (commercial bank deposit-denominated Australian dollars) by Abrahamsons to Shearer & Associates (ignoring possible fee payments by one or both parties).

Life Cycle of Economic Management Contract: Example IV

This further example of a risk management contract is an extension of Example III. More particularly, however, it is a special case of the general case of Example III, in that for a particular phenomenon the same entitlement is specified by the ordering party for each of the possible outcomes. This is a case where X=1, α(X) is not applicable, β(X)=the specified non-contingent entitlement (constant), and γ(X)=11, where "11" denotes a mathematical shape that is a straightline with respect to the 'outcome' axis, drawn from a menu of such shapes. Put another way, the gradient of the graph of entitlement (y-axis) against outcome (x-axis) is zero.

The counterparty registering data remains the same as for Example III. It can be thought of as the scenario where the outcome is not of concern to the ordering party. When its future entitlement is positive, the contract, from the ordering party's view, is in the nature of a loan, in that the consideration is made available now for a future known entitlement. It is of course possible for the consideration and entitlement to be negative so that the nature of the contract from the ordering party's viewpoint is borrowing.

The example shows just this situation, in that one party (such as an institutional fund manager) seeks to avoid the adverse consequences of not having immediate possession of a defined resource (say, Australian dollars) by becoming a party to a contract with another, as-yet-unknown, party (such as another fund manager seeking to avoid the adverse consequences of being unable to adequately utilise the defined resource).

The specific contract offering is one which provides an ordering party with a specified non-contingent obligation (that is, a negative future entitlement) to make an Australian dollar future payout to the contract's counterparty upon that counterparty's payment of a calculated up-front consideration money amount to the ordering party.

Thus, for a given guaranteed entitlement payout amount by the ordering party to its counterparty on a contract's maturity date, the up-front consideration payment is essentially a function of two matters implicitly determined between the ordering party and the counterparty registering data:

1. The discount (interest) rate applicable to the contract (this will itself be credit risk-free

Australian dollar instruments with the same maturity date, plus a margin reflecting the counterparty's assessment of the likelihood of default by the ordering party in making their required future entitlement payment in Australian dollars);

2. The counterparty's sought-after commission on the transaction.

Note that if, say, the contract entitlement is based in US dollars, the matter of the counterparty's defined forward Australian dollar/U.S. dollar exchange rate would also be relevant.

As noted, the relevant key stakeholders are the same as in Example III: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself); various product ordering parties (the relevant ones for the example being Abbotts & Taylor and Shearer & Associates); various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc); a counterparty guarantor (CNZ Banking Corporation); and an application regulator (the Pacific Central Bank).

A timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 41 and further supported by FIGS. 73-7B.

Looking at the first step in the timeline, Application Specification' in conjunction with FIG. 73, we see that BLC Inc established a Contract APP (Application ID 001) on 91.06.03.17.00.00 (that is, 5 PM on Jun. 3, 1991) to deal with economic risk management. The application involves a pricing and matching objective function of: "minimize pre-tax consideration payment under an expected value (EV)/certainty equivalent (CE) value". Note that a negative consideration payment is allowed.

Looking at the second step in the timeline, Product Specification, in conjunction with FIG. 74, we see that BLC Inc was also product sponsor of Product 10061 at the same time (91.06.03.17.00.00). This product relates again to the market of stock indices. The maturity date for Product 10061 is 96.06.03.17.00.00.00. The submarket is the PTSE 75 stock index. The consideration for a specific contract involving Product 10061 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is also in the form of commercial bank deposits denominated in Australian dollars, payable immediately after the product's specified maturity date/time.

Looking at the third step in the timeline, Potential Counterparty Product Pricing Specifications, one can find two entities, Abrahamsons and Carpenters Inc, acting as potential counterparties for forthcoming primary product orders dealing with Product 10061. At this point in the timeline (95.01.01.17.00.00.00), 43 months after the specification of Product 10061, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline, Primary Order Specification, in conjunction with FIG. 75, it can be seen that Abbotts & Taylor is seeking a contract in Product 10061 at that time (95.01.01.17.37.06.00). FIG. 75 shows the specific parameters that Abbotts & Taylor has defined for the contract it is seeking at this time, namely $A 83,830 for any feasible product value including a minimum acceptable contract consideration amount of ($A 55,000). The parentheses indicate that the consideration is negative. The calculated counter consideration ($A 55,000) will be paid by the counterparty to Abbotts & Taylor immediately after contract matching.

Looking at the fifth step in the timeline, Order Specification Pricing, in conjunction with FIGS. 76A and 76B, it can be seen that Abrahamsons (using the specified pricing parameters set at 95.01.01.17.37.06.00) prices the Abbotts & Taylor order at 95.01.01.17.38.02.00. Abrahamsons' pricing parameters, indicated by their defined circumstances ID of 31, require a commission rate of 1.25% and a discount rate of 10.00% pa. A particular set of component product prices together with a particular set of assessed probabilities of occurrence are specified. This results in a counter consideration of ($A 58,710), which Abrahamsons' parameters calculate will yield them a base margin on the contract of $A 1,980.

Still looking at the fifth step in the timeline, in conjunction with FIGS. 77A and 77B, it can be seen that Carpenters Inc (again using the specified pricing parameters set at 95.01.01.17.37.06.00) also prices the Abbotts & Taylor order at 95.01.01.17.38.02.00. Carpenters Inc's pricing parameters, indicated by their defined circumstances ID of 19, require a commission rate of 1.30% and a discount rate of 9.8% pa. A particular set of component product prices and a particular set of assessed probabilities of occurrence are specified. This results in a contract bid price of ($A 58,640), which Carpenters Inc's parameters calculate will yield them a base margin on the contract of $1,990.

Looking at the sixth step in the timeline, Primary Order Matching, it can be found that Abrahamsons' price bid of ($A 58,710) is above Carpenters Inc's bid of ($A 58,640) and above Abbotts & Taylor's specified minimum consideration price of ($A 55,000). This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons at 95.01.01.17.38.07.00. Before the matching formally occurs, a check is made that absolute loss, expected loss, expected value and portfolio attribute limits are not violated.

The seventh step in the timeline, Contact Maturity, refers to the actual determination of the product value at time of maturity, 96.06.03.17.00.00.00.

The eighth step in the timeline involves the formal payment of $A 83,830 by Abbotts & Taylor to Abrahamsons.

The example just described can also be thought of as a case where the market is irrelevant, and therefore there is no minimum or maximum product definition value nor product step value. This equates to there being no future outcome, rather simply a known specified entitlement that is not dependent upon the outcome of any particular phenomenon. The mathematical representation of curves or lines no longer is relevant. The counterparty counter consideration thus becomes a function only of the discount rate, commission and (if applicable) entitlement exchange rate.

Life Cycle of Economic Management Contract: Example V

This embodiment relates to an economic management contract (based on a variation of Example IV) and describes the formulation of an immediate exchange contract involving an entitlement of a defined $US amount in return for a to-be-determined consideration denominated in commercial bank Australian dollars.

This example is a special case of the general case of Example II in that it is independent of the outcome of any particular phenomenon. It has only a single outcome for which a single entitlement is specified by the ordering party.

Unlike Example IV, however, this case also involves a unique notion of a contract maturity date/time. This is the notion of "as soon as possible after the date/time the transaction is originated by the ordering party", implying an immediate exchange. That is, the date of maturity is now.

In this example, the offering is one which provides a contract ordering party with a specified non-contingent entitlement to receive its desired $US currency amount ($US 70,000) as soon as possible after the ordering party specifies it is prepared to immediately pay not more than $A 102,900 (as a consideration) in exchange for this US currency.

In this example, the relevant key stakeholders are: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself), various product ordering parties (the relevant ones for the example being Abbotts & Taylor), various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc), a counterparty guarantor (CNZ Banking Corporation) and an application regulator (the Pacific Central Bank).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 42, and are supported by FIGS. 78-82B.

Looking at the first step in the timeline, Application Specification, in conjunction with FIG. 78, we see that

BLC Inc established a contract APP (Application ID 201) on 91.06.03.17.00.00 (that is, 5 pm on Jun. 3, 1991) to deal with economic risk management. The application involves a pricing and matching objective function of: "maximize pre-tax consideration/entitlement exchange rate". Application ID 201 supports a range of products.

Looking at the second step in the timeline, Product Specification, in conjunction with FIG. 79, we see that BLC Inc was also product sponsor of Product 11099 at the same time (91.06.03.17.00.00). This product relates to the market of immediate exchange. The maturity date for Product 11099 is "as soon as possible after transaction initiation'. The consideration for a specific contract involving Product 11099 is commercial bank deposits denominated in Australian dollars. The entitlement is in the form of commercial bank deposits denominated in US dollars, payable immediately after the product's specified maturity date/time (that is, as soon as possible after transaction initiation).

Looking at the third step in the timeline, Potential Counterparty Product Pricing Specifications, two entities, Abrahamsons and Carpenters Inc, are potential counterparties for forthcoming primary product orders dealing with Product 11099. At this point in the time-line (92.06.03.15.00.00.00), 12 months after the specification of Product 11099, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline, Primary Order Specification, in conjunction with FIG. 80, it can be seen that an ordering party, Abbotts & Taylor, is seeking a contract from an offering party in Product

11099 at that time (92.06.03.17.00.00.00). FIG. 80 shows the specific parameters that Abbotts & Taylor has defined for the contract it is seeking at this time, including a maximum exchange (consideration) amount of ($A 102,900) and a defined $US 70,000 entitlement.

Looking at the fifth step in the timeline, Order Specification Pricing, in conjunction with FIGS. 81A and 81B, it can be seen that the system determines that the counter consideration amount Abrahamsons judge to be ideal given their specified parameters is $A 94,500. This occurs at 92.06.03.17.38.02.00. Abrahamsons' pricing parameters specify an exchange rate of 0.75, a commission rate of 1.25% and a single assessed probability of occurrence of one (1) (discount rate and component product prices being irrelevant in this example). The counter consideration of $A 94,500 is lower than Abbotts & Taylor's specified maximum consideration amount of $A 102,900.

Still looking at the fifth step in the timeline, in conjunction with FIGS. 82A and 82B, the system determines that the counter consideration amount Carpenters Inc judge to be ideal given their specified parameters is $A 101,300. Carpenters Inc's pricing parameters imply an exchange rate of 0.70, a commission rate of 1.30% and a single assessed probability of occurrence of one (1) (discount rate and component product prices again being irrelevant).

Looking at the sixth step in the timeline, Order Matching, it can be found that the system assesses Abrahamsons' to be superior to that of Carpenter Inc and below Abbotts & Taylor's maximum consideration. This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons' at 92.06.03.17.38.12.00. Matching coincides in time with maturity, and very shortly thereafter there is the transfer of $A 94,500 from Abrahamsons to Abbotts & Taylor and a corresponding transfer of $US 70,000 from Abrahamsons to Abbotts & Taylor. This then represent finalisation of the transaction, including all the transfers involved at the date/time of maturity of other contract types.

A further embodiment, relevant to each of the embodiments of Examples III to V above, involves the order pricing procedure as before, followed by a step of obligating the ordering party with the would be matched counterparty for a period of time before the match is formally made. As before, the consideration can be payable immediately upon match or deferred for a time (even up until maturity), and the date of maturity can be at a future time from matching (or even immediately upon match). The period of obligation can be specified by the promoter stakeholder, and thus be known to the ordering party and the registering counterparties. The period of obligation thus enables parties to contract to future contingent contracts (in the case of Examples I and IV) or future exchange (in the case of Example V).

7. Description of Consideration/Entitlement Payment Process

The purpose of the CONTRACT APP consideration/entitlement (and related transactions) payment/receipt process is to effect debits and credits to INVENTCO stakeholder accounts, typically at maturity of a contract, with participating consideration/entitlement transfer (or exchange) entities, reflecting payment/receipt entitlements and obligations originated within INVENTCO. The process effects these payments/receipts in a two-stage process. First, by debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts with a participating consideration/entitlement transfer entity (C/E entity), external to INVENTCO, with which they maintain an account. And second, by periodically effecting, via existing and potential payment mechanisms, corresponding payment instructions to the payment entities concerned. Details of the above-described mechanism are as follows.

All INVENTCO stakeholders maintain (a minimum of) two special-purpose (net-credit balance only) accounts with (at least) one selected, VIRPRO authorised, C/E transfer entity. The purpose of special-purpose accounts is to ensure that only INVENTCO-initiated debits and credits are capable of being effected to the accounts. Thus, at any time the balance of each PAYACC SHADOW file account record should be equivalent to the true, but usually unknown, time-of-day balance of the actual account maintained by the C/E transfer entity.

The purpose of two accounts is to enable only credits to be effected through one account and only debits through another account. And the purpose of "net-credit balance only" accounts is to ensure that accumulated debits to the debits-only account never exceed the account opening balance plus accumulated credits to the credits-only account.

C/E transfer entities will typically be (but do not need to be) institutions of any/all of six types: public/private record-registries of various types; credit card companies (typically for retail transactions only); commercial banks; central banks; taxation authorities; and non-bank clearing houses and depositories.

The resources transferred by these entities may be of any type. However, most typically, they will be deposits appropriate for the entity concerned: With respect to public/private record-registries—entitlement deposits (including shares in financial or physical assets, participation rights in wagers, and so on). With respect to credit/debit card companies—normal card company deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to commercial banks—normal bank deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to central banks—exchange settlement account (or equivalent) deposits. With respect to taxation authorities—taxation account deposits. And with respect to non-bank clearing houses and depositories—deposits of financial instruments, precious metals and the like. CONTRACT APP potential counterparties will also effectively be C/E transfer entities, as will ordering party guarantors (external to INVENTCO) where they offer credit to product ordering parties. Also, some accounts will be trust accounts maintained on behalf of potential counterparties (and some product ordering parties) involved in applications requiring the periodic payment of collateral to independent third parties to serve as an additional security device.

Immediately after the completion of its daily—or more frequent—transaction processing, and their associated settlement functions, each C/E transfer entity electronically notifies the applicable CONTRACT APP of the "opening balances" of all the debit and credit INVENTCO accounts it maintains (At this stage, the debit account balance should be zero and the credit account balance should be greater than or equal to zero). Where an INVENTCO stakeholder has an overdraft or line-of-credit with its C/E transfer entity, the credit value of this will be reflected in the non-zero balance of its credit account at this time.

Upon receipt of the above-described notifications, the applicable CONTRACT APP updates/confirms its stakeholder shadow balances. Thus, at this point-in-time, all credit and debit shadow account balances should be equivalent to their actual debit and credit account balances.

Progressively throughout the day (where "day" here is likely to be different for each C/E transfer entity due to a combination of differences in the timezone locations of payment entities in relation to the applicable CONTRACT APP, and the likely different account processing cycles of these entities), INVENTCO-stakeholder—authorised debits and credits to INVENTCO stakeholder shadow accounts are effected on a real-time basis—debits to debit accounts and credits to credit accounts. At all times, the CONTRACT APP ensures that the cumulative debit balance of each stakeholder's debits account does not exceed the "opening balance" plus the cumulative credit balance of the stakeholder's credit account. Thus, at any time, for every INVENTCO stakeholder, the combination of each stakeholder's debit account and credit account will represent the "true", net, time-of-day value of the stakeholder's two actual special-purpose accounts maintained external to INVENTCO.

Debits and credits to INVENTCO stakeholder accounts are effected according to strict rules and conditions, being different for credits and debits. Credits can be made to any INVENTCO stakeholder's credit account with its nominated C/E transfer entity by any other INVENTCO stakeholder for any reason. Naturally, as INVENTCO stakeholders will not know the account details of other stakeholders, such credits will be effected either automatically, according to information and rules known by the applicable CONTRACT APP, or semi-automatically by way of an INVENTCO stakeholder requesting from VIRPRO, as they need to do so, a credit-account number of the stakeholder to which they wish to transfer assets. This account number may only be valid for a nominated period and would not typically be the specified stakeholder's actual account number with its nominated consideration/entitlement transfer entity—it would only be a reference to an INVENTCO file containing this number.

On the other hand, debits can only be made to an INVENTCO stakeholder's debit account with its nominated C/E transfer entity by the stakeholder itself, and by other stakeholders explicitly granted this right by each stakeholder, subject to these other stakeholders exercising this right according to the rules and conditions specified for them.

Where an INVENTCO stakeholder seeks to initiate/ authorise debits to its nominated account(s) on its own, this can only be done through the stakeholder satisfactorily completing the identification and security procedures set down by their C/E consideration/ entitlement transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). The type of procedure set down by all participating C/E transfer entities involves (at least) the following: First, the consideration/entitlement transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts, and a similarly confidential "black box" which, by initiating any of a number of possible proprietary password request-response processes involving any one of its customers possessing the appropriate device(s), confirms that remote messages received from that customer, and processed by the "black box", are authentic. Second, the consideration/entitlement transfer entity supplying their INVENTCO customers with a programmable smart card (or equivalent device) enabling each customer, remotely—via telephone or direct computer line, to unambiguously confirm their identity with their INVENTCO-maintained account, thereby having the capability to authorise debits to their account within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on. Third, INVENTCO providing the mechanisms for direct, confidential, stakeholder communications with their C/E transfer entity shadow debit accounts, and the formal updating of these accounts, through non real-time processes, utilizing the unique time-stamped reference numbers created as/when stakeholders authorise access to their account records.

Where an INVENTCO stakeholder has authorised other INVENTCO stakeholders to initiate debits to (any of) its nominated account(s) according to a standing authority of some type, this can only be done through the authorised stakeholder itself satisfactorily completing the identification and security procedures set down by the authorization granting stake-holder's nominated C/E transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). Once again, the type of procedure, set down by all participating C/E transfer entities in this respect, involves (at least) the following: First, the C/E transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts and each other INVENTCO stakeholder which has been authorised to effect debits (within defined parameters) to these accounts. Second, the C/E transfer entity supplying VIRPRO with a similarly confidential black box which, by initiating any of a number of possible proprietary password request-response processes involving an entity nominated by any of its customers possessing the appropriate device(s), confirms that remote messages received from that authorised entity, and processed by the black box, are authentic. Third, the C/E transfer entity supplying their INVENTCO customers with a collection of programmable smart cards (or equivalent devices), for distribution to these authorised entities, enabling each authorised entity, remotely—via telephone or direct computer line—to unambiguously confirm their identity with the customer's PAYACC SHADOW account, thereby having the capability to authorise debits to this account (again, within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on). And four, INVENTCO providing the mechanisms for direct, confidential, authorised stakeholder communications with a stakeholder's C/E transfer entity shadow debit account(s).

At the end of each C/E transfer entity's specified day (or part of a day), the applicable CONTRACT APP transfers (at least) two things to the entity: First, if required, a series of figures representing the exchange settlement (or equivalent) accounting entries it has or will communicate to the C/E transfer entity's appropriate clearing authority (for each of the applicable consideration/entitlement denomination, currency and national currency types of the payments/receipts involved) where these figures represent the balancing net debit or credit figure corresponding to the aggregation of all of the entity's IN-VENTCO customer transactions in the prior day. And second, a detailed file of all customer transactions effected during the day (corresponding, if required, to the above-described net figures). Upon their receipt of these transactions and summary figures, the C/E transfer entity then debits/credits each transaction to the appropriate actual customer accounts, enabling new "closing" account balances to be calculated (these "closing" balances should be exactly the same as the end-of-day balances communicated by the applicable CONTRACT APPS with it's file of customer transactions). In turn, these "closing balances" become the C/E transfer entity's account "opening balances" for the next day. The CONTRACT APPS notification process then repeats itself.

Where applicable, at days-end for the "clearing house" of clusters of like C/E transfer entities (for example, a national central bank), CONTRACT APP transfers netted exchange settlement accounting entries to the clearing houses concerned. These entries serve to "balance the individual customer account entries transferred to each associated C/E transfer entity individually.

8. Industrial Applicability

The invention has industrial application in the use of electrical computing devices and data communications. The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices. The types of events associated with the risk management apparatus and methodologies includes physical and technical phenomena, and therefore have value in the field of economic endeavour.

Glossary of Key Terms

Alpha (X)

The Ordering party-specified event value corresponding to the Xth future product event value contract entitlement payoff (payout) inflection point.

Application Promoter

An entity authorised by VIRPRO that specifies and administers defined rules and regulations underlying a defined CONTRACT APP—including the specific products offered for trading; categories of, and conditions of involvement, of stakeholders; nature of involvement and dispute resolution procedures of stakeholders.

Automatic/Manual Deal and No Deal Flags

Indicators notified by each stakeholder to CONTRACT APP specifying the manner in which that stakeholder wishes to deal with each other stakeholder.

AXSCO

A communications co-ordination and security system, linked to all stakeholders and component application.

Base Pricing Probabilities

The prices set by sellers for unit entitlement payoffs of a contract at each of its possible future index values denominated in the contract's formally specified consideration/entitlement, currency and national currency.

Beta (X)

The Ordering party-specified desired entitlement payoff (payout) amount in the desired currency denomination of contract entitlement payout (payoff) and national currency denomination of contract entitlement of payout (payoff) corresponding to the Xth event value inflection point.

Bilateral Obligations Netting Indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all pairs of participating stakeholders are to be netted.

Bilateral Payments Netting Indicator

An indicator that individual end-of-day gross payments/receipts to/from all pairs of participating INVENTCO stakeholders are to be netted.

Commission Rate

The minimum required percentage profit margin required by a Potential Counterparty above the "breakeven" bid price for an Ordering party purchase order.

Consideration/Entitlement Transfer Entity

An entity acceptable to VIRPRO and the Application Promoter, satisfying defined minimum standards of financial strength, credit standing and integrity, able to maintain Consideration/entitlement accounts on behalf of stakeholders and effect transfers of those assets as directed.

CONTRACT APP Stakeholder Types

Expected stakeholder types are Application Promoter, Product Sponsor, Product Ordering party, Counterparty, Counterparty-Guarantor, Regulator, Consideration/entitlement transfer Entities and Miscellaneous other parties.

Contract and Product "Absolute Loss" Limit

A value limit specified by a potential counterparty of the maximum absolute loss it is prepared to sustain on a contract/product irrespective of the assessment of the likelihood of any particular level of possible loss being incurred.

Contract and Product "Expected Loss" Limit

A value limit specified by a potential counterparty of the maximum expected loss it is prepared to sustain on a contract/product based on the counterparty's assessment of the likelihood of all levels of possible loss being incurred.

Contract Authorisation

A process of verifying that an Ordering Party product purchase order contains data appropriate to the product being sought and that the Ordering Party is accurately identified and credentialled.

Contract Collateralisation Indicator

A descriptor set by the Application Promoter specifying whether and on what basis, counterparties may be required to periodically transfer assets/monies (collateral) to an independent trust fund to ensure they will be able to meet their potential entitlement payoff obligations on the maturity date of a contract.

Contract Confirmation

The process of securing the positive agreement of all affected stakeholders to a purchase order, including acknowledgement by the relevant Consideration/ entitlement transfer entity of the Ordering party' ability to pay the required product consideration and fees, either automatically or through manual approvals.

Contract Matching

See Ordering party/Potential counterparty matching process.

Contract Obligation

a. A binding commitment one entity (or group of entities) has to provide products or services or information to another entity (or group of entities) in exchange for an agreed quantity of other products, services or information.

b. A binding commitment all entities have to the network and general management system entity VIRPRO and thus to each other, to accept constraints on their activities imposed by other authorised on terms specified and agreed to by them as a condition of their participation in one or more of the component systems.

Contract Portfolio Netting

A terms used to describe the process of "setting-off" or "netting", the future payment entitlement obligations between Ordering parties and Counterparties, either bilaterally or multilaterally.

Currency and National Currency Exchange Rates

The rates used to convert contracts consideration/ entitlement currency and national currency requirements into the product's consideration/ entitlement currency and national currency denomination.

Deal Flag

An indicator or "flag" notified to CONTRACT APP signifying that the stakeholder is satisfied to deal unreservedly with the stakeholder against whom the flag has been set.

Defined Circumstances

The possible combinations of the categories of product-order information provided by Ordering parties.

Defined Probability Distributions

A set of pricing probability parameters specified by an Ordering party and including at least, a probability distribution type identifier, the expected value of the distribution, the standard deviation of the distribution and a probability distribution adjustment value or function.

Desired Currency Denomination of Contract Entitlement

A term indicating the currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired Currency Denomination of Consideration Payment

A term indicating the currency in which an Ordering party wishes to pay the required consideration for the contract sought.

Desired National Currency Denomination of Contract Entitlement

A term indicating the National currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired National Currency Denomination of Consideration Payment

A term indicating the National currency in which the Ordering party wishes to pay the required consideration for the contract being sought.

Discount Rate

The rate used to determine the present value of a potential counterparty's expected future entitlements.

Entitlement

The payout expected by the offering party at maturity as specified for each outcome in the range of outcomes. The payout can be both positive and negative in value over the range of outcomes, and can be in the form of money or other non-money types of goods, services, promises, credits or warrants.

EV-CE Pricing

A price discovery mechanism for primary contracts meaning "expected value certainty equivalent pricing" being the calculated expected present value or future value of the contract.

Expected Value

A function in EV-CE pricing which means the sum of the product of all possible contract entitlement payoff/payout amounts of the Ordering party's/ Counterparty's assessment of the probability of occurrence of the future events which would contractually give rise to these entitlement payoff amounts.

Expected Value Limits on a Counterparty's Aggregate Product Portfolio

Optional value limits specified by a Potential counterparty at any one time, where time can be specified in terms including "equivalent maturity date"; "same-month maturity date" and "all possible maturity dates" including product expected loss limits and maximum (and possible minimum) proportion of the expected total loss of the aggregate of the Counterparty's product portfolio that can be accounted for the expected loss on the individual contract/product.

Gamma(X)

The Ordering party-specified desired shape of the function between each of the coordinates Alpha(1), Beta(1) and Alpha(2), Beta(2) and so on; such that Gamma can represent all possible mathematically definable shapes.

I-INVENTCO

The infrastructure component of INVENTCO.

INVENTCO

A collection of one or more (potentially interrelated) systems, where each system is the combination of a telecommunications, computing and other forms of infrastructure, and a variety of markets and support services distributed by this infrastructure.

M-INVENTCO

A depository of VIRPRO authorised "markets" application software.

Manual Deal Flag

An indicator or "flag" notified to CONTRACT APP by a stakeholder signifying that the stakeholder wishes to manually approve a transaction involving the other stakeholder against whom the flag has been set.

Multilateral Payments Netting Indicator

An indicator that individual end-of-day gross payments/receipts to/from all participating stakeholders from/to a specified third party trustee/clearing entity are to be netted.

Multilateral Obligations Netting Indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all participating stakeholders from/to a third party trustee/clearing entity are to be netted.

Negative Contract Payoffs

A type of contract in which the contract Ordering party may have a contingent payoff to the contract's Potential counterparty (i.e. the reverse of a normal contract).

No Deal Flag

An indicator or "flag" notified to a CONTRACT APP by a stakeholder signifying that the stakeholder does not wish to deal in any way with the other stakeholder against whom the flag has been set.

Ordering Party Contingent Claims Function

Specifications of a product payoff or a mathematical function to calculate an Ordering party's product payoff requirement.

Portfolio Product "Expected Loss" Limit

A value limit, specified by a potential Counterparty, of the maximum expected loss the potential Counterparty is prepared to sustain on its product portfolio based on the Counterparty's assessment of the likelihood of all levels of possible loss being incurred.

Product Ordering Party

An entity acceptable to VIRPRO and the Application Promoter, interested in and able to acquire a CONTRACT APP product.

Product Establishment Date/Time

The date/time an Application Promoter first offers a defined product for trading.

Product Future Event Value "Density" Indicator

An indicator specifying the number of intermediate points between the minimum and maximum future event product definition values specified for the product by the Application Promoter/Product Sponsor.

Product Event Value "Width" Indicator

An indicator specifying the range (minimum-maximum) of future event values accommodated by the product as set by the Application Promoter/ Product Sponsor.

Product Future Event Value

A term used to indicate the actual values of a defined product at its date/time of maturity.

Product Maturity Date/Time

The date-time at which the Application Promoter is required to make a determination of the actual event value to enable entitlement and related payoffs on successful contracts.

Product Price Quote Requests

A type of product purchase order for which the matching process is terminated and the result communicated to the Ordering party, when a desired price bid or range of price bids has been obtained.

Product Purchase Orders

Specific product purchase orders for which the Ordering party is seeking a potential Counterparty match, which may be of three types: automatic orders; manual orders and "hide" orders.

Product Purchase Order Withdrawals

Ordering party-initiated requests to withdraw from processing pre-submitted but as yet unconfirmed product purchase orders.

Product Potential Counterparty

An entity acceptable to VIRPRO and the Application Promoter, exceeding a defined minimum standard of financial strength, credit standing and integrity, offering defined CONTRACT APP products to product Ordering parties.

Product Sponsor

An entity acceptable to VIRPRO and the Application Promoter, having responsibility for detailed definition of product parameters including the continual determination of product values over time.

Regulator

An entity acceptable to VIRPRO having local, state, national or international jurisdiction over one or more CONTRACT APPS.

Set of Pricing Probabilities

The range of probabilities a potential Counterparty applies to a class of Ordering party order, specified by the value of "defined circumstances" and applying to every feasible future product event defined for that product by an Application Promoter.

Stakeholder

An entity that is a registered participant in one or more INVENTCO's component parts.

Value Dates

The respective dates/times at which matched contract consideration and entitlements are agreed to be made by the relevant Ordering party/Counterparty to a contract.

VIRPRO

The network and general management system component of INVENTCO.

"X"

A term indicating the number of contract payoff (payout) inflection points the Ordering party is seeking within the allowable range of future product event values (including the value range extremity points).

CONTRACT APPS

Overview

CONTRACT APPS is a term used to refer to certain types of units of applications software which can, but do not need to, reside within an INVENTCO system's (M-INVENTCO) depository of "markets" software. The purpose of individual CONTRACT APPS is two-fold: First, to effect the trading/exchange/transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trade/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through their time of maturity, including their ultimate settlement.

Individual CONTRACT APPS perform these tasks according to the specific rules they embody, defined by their own stakeholders. CONTRACT APPS effectively reside upon AXSCO and within M-INVENTCO.

Stakeholder Types

CONTRACT APPS accommodate eight (and potentially fewer) generic types of their "own" stakeholders (as distinct from other INVENTCO stakeholders) termed: application promoter, product sponsors, product ordering parties, potential product counterparties, counterparty-guarantors, regulators, consideration/ entitlement transfer entities, and other miscellaneous parties.

Some details of these stakeholders are as follows: an application is an entity having overall responsibility for the functioning of a CONTRACT APP (that responsibility having been granted by the VIRPRO); a product sponsor is an entity which promotes and administers the rules of trading, and subsequent management, of defined contingent claims contracting product(s) selected for inclusion in a CONTRACT APP by its application promoter; a product ordering party is an entity seeking to acquire a CONTRACT APP product from a potential product counterparty (where a product ordering party can also be a product counterparty); a potential product counterparty is an entity potentially prepared to satisfy the CONTRACT APP product needs of a product ordering party (where a potential product counterparty can also be a product ordering party); a counterparty-guarantor is an entity guaranteeing a product counterparty's ability to settle any/all of its potential entitlement transfer obligations to a product ordering party to which it has become a counterparty as a result of a CONTRACT APP effected "match"; regulators are entities overseeing the ongoing performance of all other stakeholders involved in a CONTRACT APP, especially counter-party-guarantors; consideration/entitlement transfer entities are entities with which all other CONTRACT APP stakeholders maintain "accounts" to transfer required considerations/entitlements to/from all each other; and miscellaneous parties are all other entities having a defined stake in the functioning of a CONTRACT APP.

Miscellaneous parties include: independent entities contracted by application promoters or product sponsors to formally determine the "value" of products on their date-of-maturity; multilateral obligations and payment netting trustee/clearing entity organisations; independent (non-regulator) taxation and other governmental authorities; electronic "gateway" providers (external to INVENTCO); and host system organizations (in the case of CONTRACT APPS within INVENTCO systems linked to a common host system). CONTRACT APPS accommodate any number of their own stakeholders of each of the above-defined generic types.

Product Types

CONTRACT APPS can support risk aversion contract "product types" with any combination of values of multiple attributes, including: the fundamental nature/purpose of the product; the establishment/ maturity date/time of the product; the consideration/ entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/ entitlement identifiers associated with the product; the "width" and "density" identifiers of possible future event values of the product; and miscellaneous other product descriptors.

The "fundamental nature/purpose of the product" attribute may incorporate identifiers including: a conditional entitlement-payoff dimensions identifier; a market identifier; a sub-market identifier; and a market-type identifier. The "conditional entitlement-payoff dimensions identifier" specifies the number of dimensions to an ordering party's sought-after conditional entitlement-payoffs. The market identifier specifies whether the product relates to an "actual" or "perceived" phenomenon (or phenomena), the number of such phenomena (if applicable), and the applicable phenomenon category (for example, industrial, scientific, financial market hedging, and so on). The sub-market identifier provides a more specific description of the product concerned. The market-type identifier specifies the applicable future period date/time (where this can be anything—for example, "at a defined contract maturity date/time", "at a specified time on or before contract maturity date/time", and so on), and type-of-future event involved (where, again, this can be anything—for example, as an indicator of some relative value of a phenomenon (spot value, average value and so on), or as an indicator of the "rate-of-change" of some value of a phenomenon.

The "establishment and maturity date/time of the product" attribute specifies, respectively, the date/time an application promoter first offered a product for trading, and the date/time the defined product matures (that is, the date/time at which the product sponsor is required to make a determination of the actual event at that date/time so enabling contract entitlement transfers to be effected).

The "consideration/entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/entitlement identifiers associated with the product" attribute specify: the type of consideration/entitlement involved (where this can include rights and entitlements, physical assets, and "money" of all possible types); in the case of a "money" consideration/entitlement type, the currency of the consideration/entitlement (where such currency types can include: public/private record-depository deposits, commercial credit card company deposits, commercial bank deposits, central bank deposits, taxation authority deposits, and deposits in non-bank clearing houses and depositories, and the like); and, again, in the case of a "money" consideration/entitlement type, the national currency of the consideration/entitlement identifier (where such currency types can be in any national currency, or form of synthetic currency).

The "width and density identifiers of possible future event values of the product" attribute specifies, respectively: the minimum and maximum values of the allowable range of future event values accommodated by a product; and the number of intermediate points between the defined minimum and maximum future event values accommodated by the product.

The "miscellaneous other product descriptors" attribute specifies such things as: the degree of stakeholder access granted the product by the application promoter in question; the forms of trading-services granted the product by the application promoter in question (where this product attribute specifies the accessibility of the product to a range of feasible "stakeholder services" with respect to such things as contract portfolio netting, contract collateralisation, consideration credit provision, ordering party ability to specify negative contract entitlements, and availability of secondary/derivative market product rating); and the degrees of trading, clearing and settlement "transparency" granted the product by the application promoter in question.

Transaction Types

A range of primary, secondary, derivative-primary, and derivative-secondary risk aversion contract transactions are accommodated by CONTRACT APPS.

The range of "primary" (and derivative-primary (options, for example)) risk aversion Contract transaction-types (handled principally by Processes 2 and 4 include: ordering party product orders (and option orders) for which the ordering party is seeking a counterparty "match", ordering-part), price quote (and options price quote) requests; and ordering-party withdrawals of existing product orders (and withdrawal of options on product orders). Ordering party product orders consist of: automatic orders and manual orders. Automatic orders consist of: normal automatic orders (being orders the ordering party is prepared to have matched automatically, subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the ordering party is prepared to have matched automatically, subject to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the ordering party). Manual orders consist of normal-manual orders (being orders the ordering party wishes to manually authorise before they are finalised—that is, after a counterparty "match" has been effected but before the contract has been "confirmed"—subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stake-holders have prespecified); and anonymous-manual orders (being orders the ordering party wishes to manually authorise before they are finalised—that is, after a counterparty "match" has been effected but before the contract has been "confirmed" subject to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the ordering party).

The range of "secondary" (and derivative-secondary (options, for example) risk aversion contract transaction-types (handled principally by Processes 3 and 5 include: acquiring party product orders (and option orders) for which the acquiring party is seeking to "acquire" the position of a specified "risk counterparty" stakeholder in an existing contract; acquiring-party product price indications (and option price indications); and acquiring-party withdrawals of existing product orders (and option withdrawals).

Acquiring product party orders for which the acquiring party is seeking to "Acquire" the position of a specified "risk counterparty" stakeholder in an existing contract, consist of automatic orders and manual orders.

Automatic orders consist of: normal-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject only to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CON-

TRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the acquiring party).

Manual orders consist of normal-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised—that is, after a "match" has been effected but before the contract "sale" is "confirmed"—subject only to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised—that is, after a "match" has been effected but before the contract "sale" is "confirmed"—subject to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the acquiring party).

Primary Product Pricing Process Types

CONTRACT APPS enable potential counterparties to automatically establish "bids" on any defined (primary and derivative-primary) product order according to either an "expectedvalue/utility-certainty equivalent" (EV/U-CE) pricing regime, or any other mathematically-definable pricing regime.

In the case of an "expected value-certainty equivalent" (EV-CE) pricing regime, each potential counterparty specifies, amongst other things: an indicator of certain defined attributes of an as-yet-unknown product order; a base commission rate; a base discount rate; (if applicable) a set of base consideration/entitlement denomination, currency, and nation-al currency exchange rates; base unit product prices; and desired adjustments to the preceding base-bid-price determinants dependent on any specific order (submitted by a specified ordering party).

The above-described indicator of certain defined attributes of an as-yet-unknown product order (termed, defined circumstances) may reflect any combination of the multiple characteristics of an order (irrespective of the ordering party concerned) including: the multiple attributes of the contingent claims function sought; the ordering party's interest or otherwise in being granted credit by a counterparty; the ordering party's interest or otherwise in participating in the possible netting and collateralisation features of the APP; and the maximum (and possibly minimum) consideration amount of the ordering party is prepared to pay for their defined product. The above-described base commission rate specifies the minimum required percentage profit margin required by the counterparty above their breakeven consideration bid price for a product order.

The above-described base discount rate determines the present value of the counterparty's expected future entitlement associated with a contract (net of the ordering party's consideration, and making allowance for the future income stream this consideration is expected to generate). The above-described set of base consideration/entitlement denomination, currency and national currency exchange rates are used, where applicable, to convert an ordering party's contract requirements into the base consideration/entitlement denomination, currency and national currency of the product so enabling the contract matching process to make like comparisons of counterparty bids for product orders.

The above-described base unit product prices are prices set by potential counterparties for unit entitlement-payoffs of a contract at each of its possible future values, denominated in the contract's formally specified consideration/entitlement type and, if applicable, currency type and national currency type (where these unit prices can be specified as directly input figures for every feasible future product event (the sum of which may or may not add to 1), or as parameters of defined mathematical functions). The above-described desired adjustments to the preceding base-bid-price determinants dependent on the specific ordering party submitting a specific order can include: a commission rate adjustment; a discount rate adjustment; a consideration/denomination exchange rate adjustment; a currency exchange rate adjustment; and a national currency exchange rate adjustment.

In the case of an "expected utility-certainty equivalent" (EU-CE) pricing regime, each potential counterparty specifies all of the above-described parameters applicable to a EV-CE pricing regime as well as "utility bench-mark" figures for all possible consideration and entitlement "payment amounts" which could, conceivably, be associated with a product/contract.

Primary Product Matching Process Types

CONTRACT APPS may similarly accommodate any of a number of possible (primary or derivative-primary) order matching processes where these processes can be of multiple types, including sequential processes and simultaneous processes.

Sequential order matching processes can be characterised according to the "sequence determining" and "matching" rules they embody, where "sequence" rules may be of various types: "last-in-first-out (LIFO)", "first-in-first-out (FIFO)", priced priority, and so on; and matching rules may also be of various types—for example, a specific matching process could seek, for each product ordering party, a counterparty (or counterparties) offering a product price at or below the maximum price the ordering party is prepared to pay (where the determined contract could be either the lowest price offered by a potential counterparty, the mid-point between an ordering party' s specified "maximum consideration amount" and the lowest price offered by a potential counterparty, and so on); or seek for each potential product counterparty an ordering party prepared to pay the maximum price above a price at which the counterparty is prepared to deal (here, the determined contract price could be either: the ordering party's "maximum consideration amount" price, the mid point between the minimum price the counterparty is prepared to receive and the ordering party's "maximum consideration amount" price, and so on).

Simultaneous order matching processes are those seeking some type of optimum solution according to pre-defined objectives. For example: "maximise the number of ordering party-counterparty matches"; "maximize the aggregate consideration and/or entitlement value of ordering party-counterparty matches"; or "minimize the value of a function specifying the sum of the difference (possibly weighted according to their perceived importance) between the actual and desired values of match attributes of ordering parties and counterparties".

Both of the above-described sequential and simultaneous matching processes can also accommodate conditional contract matching rules; and pre and post tax price optimisation mechanisms.

Application Types

CONTRACT APPS may be: "in-house" APPS or "public" APPS; "single potential counterparty" APPS or "multiple potential counterparty" APPS; APPS with differing degrees and forms of "regulator" over-sight of other application stakeholder; and APPS with differing degrees and forms of "counterparty-guatantor" oversight of product potential counter-parties.

CONTRACT APPS support consideration "payment" value dates being "immediate" (meaning exactly the same at which a contract match is confirmed); or deferred until a defined time in the future, measured in terms of seconds, minutes, hours, or days. Similarly, CONTRACT APPS support entitlement "payment" value dates being "immediate" (meaning exactly the time at which the applicable application promoter formally notifies other CONTRACT APP stakeholders of the "result" of a maturing contract); or deferred until a defined time after the "result" of a maturing contract is known.

CONTRACT APPS allow contracts to be modified and liquidated after their creation. Contracts can be modified through: direct negotiation by the relevant "risk counterparties" to a particular contract; or the purchase/sale of "derivative" secondary risk aversion contract transactions (See Process 5 description below). Contracts can be similarly liquidated after their creation through sale of the contract (within or outside INVENTCO); and through direct negotiation between the initial ordering party and counter-parties to the contract. They can also be effectively liquidated through the ordering party/counterparty acquiring a mirror image of the contract to which they are a party (within or outside of INVENTCO).

Post Order Process Types

CONTRACT APPS undertake various generic types of "post-order-process" management functions for all of the above-described generic types of "transactions", including: a function which maintains a formal record of contractual commitments entered into by all CONTRACT APP stakeholders with one an-other, and with VIRPRO-authorised entities external to either the applicable CONTRACT APP or INVENTCO overall; a function which effects the independent valuation of consideration and entitlement obligations between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects "collateralisation" consideration/entitlement transfers between CONTRACT APP stakeholders, and between CONTRACT APP stake-holders and VIRPRO-authorised entities external to each applicable CONTRACT APP, based on above-described valuations of consideration and entitlement obligations associated with CONTRACT APP transactions; a function which determines and effects, as required, the bilateral netting of accumulated "consideration/entitlement" obligations "between CONTRACT APP stakeholders, and between

CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, the multi-lateral netting of accumulated "consideration/entitlement" obligations" between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nominated third-party "clearing house" entity); a function which manages the processing, accounting, reporting, and entitlement "payment" tasks associated with maturing contracts; a function which determines system usage and access fees payable to/from all CONTRACT APP (and other INVENTCO, stakeholders, and to/from VIRPRO-authorised entities external to INVENTCO; a function which determines and effects, as required, "bilaterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders themselves, and from/to CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, "multi-laterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders them-selves, and from/to CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nominated third-party "clearing house" entity); and a function which compiles and distributes CONTRACT APP (and other INVENTCO) stakeholder customised information.

Supplementary Process Types

CONTRACT APPS undertake various other types of support processes, including: enabling stakeholders to transfer consideration, entitlement and other "payment" obligations to and from one another, independently of transfers initiated by CONTRACT APP transactions (See Process 7 description below); providing CONTRACT APP (and other INVENTCO) stakeholders with shared access to specialist systems to assist them to decide how best to interface with the multiple aspects of INVENTCO (See Process 8 description below); and providing CONTRACT APP (and other INVENTCO) stakeholders with access to a range of INVENTCO-facilitated "value added services" (See Process 9 description below).

Order Matching Constraint Types

For their operation, CONTRACT APPS require all stakeholders to a specific APP to specify, amongst other things, which other stakeholders they do and do not want to have interactions with, and the conditions under which they wish to manually authorise some aspect of a transaction involving any other CONTRACT APP stakeholder over which they have control authority of some form.

In specifying which other stakeholders they do and do not want to have interactions with, CONTRACT APP stakeholders have various options. Application promoters can specify acceptable product sponsors, products, ordering parties and potential counterparties within their application—individually and by type. Similarly, product sponsors can specify acceptable application promoters, products, ordering parties, potential counterparties and counterparty-guarantors within their application—individually and by type.

Product counterparties and ordering parties (collectively) can specify: ordering parties/potential counterparties they do and do not want to deal with—individually and by type; the extent of their preparedness to be involved in contract netting and collateralisation arrangements provided for by their application promoter; application promoters, product sponsors, products, and consideration/entitlement transfer entities they do and do not want to deal with—individually and by type; ordering parties/potential counterparties they prefer to deal with, and those with which they wish to deal exclusively; the degree of trading transparency they require; and their wish or otherwise to manually authorise order matches before they are confirmed.

Potential counterparties can specify which ordering parties, or classes of ordering parties, they are prepared to offer credit to (and under what terms), and ones they are prepared to allow "ordering party-guarantors" to offer credit to and under what terms. Similarly, product ordering parties (uniquely) can specify: counterparty-guarantors with which they do and do not want to deal (individually and by type); counterparties with which they wish to deal exclusively or preferentially to obtain a particular form of counterparty-credit; and potential "ordering party-guarantors" (external to INVENTCO) with which they do and do not want to deal.

Counterparty-guarantors can specify which potential counterparties have their authority to operate and which application promoters, product sponsors and ordering parties they are prepared, indirectly, to have relationships with. Similarly, regulators can specify which counterparty-guarantors, potential counterparties, ordering parties, application promoters, product sponsors and products have their authority to operate. Finally, consideration/entitlement transfer entities can monitor and maintain up-to-date rules with respect to ordering parties, counterparties, application promoters, product sponsors, counterparty-guarantors, and regulators they are and are not prepared to deal with—individually and by type.

Ordering Party Requirements

For their operation, CONTRACT APPS require primary product ordering party stakeholders to a CONTRACT APP, in registering an order for a product of their choice, to specify: the above-described "product type" and "other stakeholder involvement" information; multiple attributes of the specific order they are seeking; their interest or otherwise in being granted credit by potential counterparties for their contract consideration amount, or in availing them-selves of the possible netting and collateralisation features of the APP concerned; the maximum (and possibly minimum) consideration "price" they are prepared to pay for their defined product; and various other dimensions of their needs, where these include: the name/title by which they wish to be identified by other APP stakeholders; the time at which they wish their order to be submitted; the period of time after an order has been submitted that they wish the order to be retained before it is automatically withdrawn; whether or not they are prepared to accept partial matches of their order; the degree of market transparency they wish to be exposed to; whether or not they wish to have the option of trading a matched contract on an authorised INVENTCO secondary market (See Process 5 description below); whether or not they wish to manually consider/authorise potential counterparty quotes on an order; in the case where potential counterparty quotes are required to be manually considered/authorised, the maximum time after potential counterparty quote details are provided to the ordering party that the ordering party wishes to consider the quote(s); and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received.

The above-mentioned multiple attributes of a specific primary order an ordering party is seeking include: their wish or otherwise to directly input the entitlement "coordinates" of their desired contingent claim order; their wish or otherwise to mathematically specify an entitlement function reflecting their desired product order, where such functions can be single or multidimensional (indicating a contingent contract entitlement conditional on two or more phenomena); the "conditional/entitlement unit", "currency" (if applicable), and "national currency" (if applicable) in which they wish to "pay"/"receive" their con-tract consideration/entitlement. Where an ordering party wishes to mathematically specify their desired primary product order as a single-dimensional entitlement function: the input term "X" can indicate the number of contract entitlement "inflection points" the ordering party is seeking within the allowable range of future product event values (including the value range extremity points); the input term "Alpha (X)" can indicate the ordering party-specified event value corresponding to the Xth future product event value contract entitlement inflection point; the input term "Beta (X)" can indicate the ordering party-specified desired entitlement amount (in the desired "consideration/entitlement form", "currency" and "national currency" entitlement denomination) corresponding to the Xth event value inflection point; and the input term "Gamma (X-1)" can indicate the ordering party-specified desired shape of the function between each of the co-ordinates: [Alpha (1), Beta (1)] and [Alpha (2), Beta (2)], [Alpha (2), Beta (2)] and [Alpha (3), beta (3)], and so on (as applicable), where Gamma can represent all possible, mathematically definable, shapes.

Potential Counterparty Requirements

For their operation, CONTRACT APPS also require primary product "potential counterparty" stakeholders to a CONTRACT APP to define various parameters on the basis of which they can automatically price orders, including parameters with which they wish to establish a "consideration bid" on a defined product order; possible individual contract and product constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order; and possible expected-value product-portfolio constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order.

In parameters with which they wish to establish a "consideration bid" on a defined product order under a "EV-CE" pricing regime (described above), each potential counterparty is required to specify, amongst other things: and indicator of the appropriate "defined circumstances" of all possible product orders; a base "commission rate"; a base "discount rate"; (if applicable), a set of base "consideration/entitlement denomination", "currency" and "national currency" exchange rates; base "unit product prices"; and desired adjustments to the base commission rate, discount rate, exchange rates, and unit product prices on specific product orders according to the determined-value of the "defined circumstances" indicator (based on a specific product order).

Possible individual contract and product constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order, include: an absolute loss limit constraint (this constraint being specified as a single-figure constraint and/or as a function constraint); an expected loss limit constraint (this constraint defining the maximum "expected" aggregate loss the potential counterparty is prepared to incur on a contract/product, taking into account their assessment of the likelihood of all feasible future product values occurring); and a constraint on the maximum proportion of the expected total loss of the aggregate of the potential counterparty's contracts/products that can be accounted for by the expected loss of the defined individual contract/product. Similarly, possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order include the maximum (and possibly minimum) proportion of the expected total loss of the aggregate of the potential counterparty's product portfolio that can be accounted for by the expected loss of an individual contract/product.

Communications

CONTRACT APP stakeholders communicate with their applicable APP via AXSCO. Individual "stakeholder-to/from-AXSCO" communications can be by way of any/all of the following: voice communications with an AXSCO-linked "live operator" or "recorded messaging" system; touch-telephone communication with AXSCO directly; or computer-to-computer link with AXSCO (via a dedicated or dial-up communications line). With all three forms of communication, CONTRACT APP stakeholders may be required to utilize specified computer hardware and/or software mechanisms in their communications with AXSCO (including "payments" authorisation "black box" devices referred to below).

Component Process

In their manifestation as telecommunications/ computer software residing on telecommunications/ computer hardware, individual CONTRACT APPS consist of a cluster of processes, utilizing a number of data files, residing on one or more processing units. A cluster of nine (and potentially more or fewer) specific processes and their related data files reside within a CONTRACT APP: a process handling file administration and updating tasks supporting all other processes (termed Process 1); a process handling the receipt and processing of "primary" risk management contract transactions (termed Process 2); a process handling the receipt and processing of "secondary" risk management contract transactions (termed Process 3); a process handling the receipt and processing of "derivative-primary" risk management con-tract transactions (termed Process 4); a process handling the receipt and processing of "derivative-secondary" risk management contract transactions (termed Process 5); a process handling the "back office" management of all four types of risk management contract transactions (termed Process 6); a process handling non-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7); a process handling CONTRACT APP (and other INVENTCO) stakeholder access to specialist systems to assist these stakeholders decide how best to interface with the multiple aspects of INVENTCO (termed Process 8); and a process handling CONTRACT APP (and other INVENTCO) stakeholder access to a range of

INVENTCO-facilitated "value added services" (termed Process 9). These processes may function concurrently.

Description of CONTRACT APP Processed

Process 1

Process 1 handles file administration and updating tasks supporting all other processes (FIG. 18), The PRODUCT, PRODUCT TRANS, DEAL LIST and DEAL LIST TRANS files referred to in FIG. 18 are applicable, individually or collectively, to primary, secondary, derivative-primary, and derivative-secondary contract orders. The SEL PRICE, SEL PRICE TRANS, SEL LIMIT and SEL LIMIT TRANS files are applicable only to primary and derivative-primary contract orders. The TRADE PRICE, TRADE PRICE TRANS, TRADE LIMIT and TRADE LIMIT TRANS files are applicable only to secondary and derivative-secondary contract orders.

The file administration and updating tasks handled by Process 1 comprise: dealing with general data-file information received from CONTRACT APP stakeholders; dealing with general data-file and order processing information received from relevant other INVENTCO stakeholders, particularly VIRPRO and AXSCO; dealing with trading support information received directly from CONTRACT APP stakeholders; dealing with potential counterparty primary, and derivative-primary, product order "consideration bid" parameters and order-match constraints; dealing with existing-contract offering party secondary, and derivative secondary, order match conditions; and dealing with miscellaneous information from entities external to INVENTCO.

Existing and prospective stakeholders are required to supply their applicable CONTRACT APP with specified identification and other information, and to continually maintain the integrity of this information. For each stakeholder, this information includes: applicable name(s), addresses, contact numbers, and references; their desired system access medium; their consideration/entitlement transfer entity account details; and, if applicable, their required schedule and fees and charges payable by other INVENTCO stakeholders. This information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

VIRPRO is required to supply the applicable CONTRACT APP with various forms of general data-file information including: identification data relating to the application promoter for (each) CONTRACT APP; details of the permitted types of system access mediums; and consideration/entitlement denominations available in each application. Again, this information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

VIRPRO is similarly required to supply the applicable CONTRACT APP with various forms of general data-file information including: information on all data received by and sent from the various parts of INVENTCO to one another and to entities external to INVENTCO; and statistical information of various types, including data traffic volumes, data file location information and so on. This information is continuously collected by AXSCO and maintained in the data file HISTORY.

Trading support information received directly from CONTRACT APP stakeholders comprises stakeholder relationship information of a general nature, and specific information from individual stakeholders.

Stakeholder relationship information of a general nature comprises "transaction communication parameters" and automatic/manual deal and no deal flags". Transaction communication parameters are parameters set by all (registered) CONTRACT APP stakeholders defining the bounds within which they wish, for security reasons, all of their communications within INVENTCO to fall. Automatic/manual deal and no deal flags are "flags" set, as required, by all (registered) CONTRACT APP stakeholders indicating their requirements with respect to dealing with other CONTRACT APP stakeholders. This information is maintained in the data file DEAL LIST, updated information being received by way of the transaction file DEAL LIST TRANS.

Specific information from individual stakeholders differs according to category of stakeholder involved.

Application promoters provide, amongst other things: information for the data file, PRODUCT (updated transactions being received from the file, PRODUCT TRANS), and further information for the data file ADMIN (updated transactions being received from the file, ADMIN TRANS). Information for the data file, PRODUCT includes details of the specific products application promoters offer for trading/exchange/transfer. Information for the data file, ADMIN includes: the order pricing and matching process upon which their application is based; the consideration/entitlement "value date" regime upon which their application is based; the categories of other stakeholders allowed to participate in the application and the conditions under which they can do this; the specific rules of engagement of counterparty-guarantors by potential counterparties; the availability and, in turn, the terms and conditions for CONTRACT

APP stakeholder utilization of "consideration credit", "collateralisation", and "netting" features of the application (embodied in the various post-order processing management routines); and details of the consideration/entitlement transfer entities involved in the application and relevant security information concerning account access.

Product sponsors provide full detail of the product(s) they are sponsoring; product ordering parties and potential counterparties (collectively) indicate, with respect to each other, the parties they either prefer to deal with or wish to deal with exclusively. Potential counterparties (exclusively) provide a variety of specific information, including: details of the Application promoter, Product sponsor, and Counterparty-guarantor rules under which they have chosen to operate; data recording the lines of credit (if any) offered to the ordering parties and the general and specific terms and conditions of these credit lines (applicable to ordering parties individually and/or to defined classes of ordering parties); parameters with which a potential counterparty wishes to determine its consideration "bids" on orders. Counterparty-guarantors provide details of the potential counterparties (if any) they have agreed to guarantee and the nature of such guarantees. Regulators provide details of: all entities having a stake in the application and their relationships to one another (for example, which counterparty-guarantors cover which counter-parties, which potential counterparties offer which products, and so on); specific regulations developed for the regime; and parameters defining the taxation treatment of all types of orders and related transactions. Consideration/entitlement transfer entities provide "setup" and on-going account access and balance-updating services. All of the above-described information is maintained in the data file, ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

In dealing with potential counterparty primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required, amongst other things, to: define various parameters with which they wish to establish a consideration bid on a defined product order; and define parameters with which the potential counterparty wishes to determine adjustments to the "base-price" bids on product orders according to the specific ordering party involved (this information is maintained in the data file SEL PRICE; updated information is received by way of the transaction files SEL PRICE TRANS); define possible individual contract and product constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order; and define possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order (these latter two categories of information are maintained in the data files SEL LIMIT and BUY LIMIT; updated information being received by way of the transaction file SEL LIMIT TRANS).

In dealing with existing-contract offering party secondary order match conditions, offering parties are required, amongst other things, to specify: the Order IDs of the contracts in which the entity concerned wishes to "sell" its position as a contract stakeholder, and, for each such contract, the pricing and other parameters it requires to be satisfied before a contract position "sale" is effected. This information is maintained in the data file TRADE PRICE; updated in-formation is received by way of the transaction file TRADE PRICE TRANS.

In dealing with potential counterparty derivative-primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required to provide essentially the same information described above in relation to primary product order. However, in addition, information directly applicable to the relevant type of derivative-primary transaction concerned (say, an option to establish a primary product order at a later date) is also required.

In dealing with existing-contract-offering party derivative-secondary order match conditions, offering parties are required to provide essentially the same information described above in relation to secondary product orders. However, in addition, information directly applicable to the relevant type of derivative-secondary transaction concerned (say, an option to sell a position in a primary product order at a later date) is also required.

In dealing with miscellaneous information from entities external to INVENTCO, this information can be of any type and may, potentially, be used by any part of INVENTCO; the information is maintained in the data file ADMIN with updated information being received by way of the transaction file ADMIN TRANS

Process 2

Process 2 handles the receipt and processing of "primary" risk management contract transactions, such transactions being of multiple types. Various sub-processes of Process 2 handle the receipt and processing of all possible types of these transactions, including product order processing, price quote requests, and withdrawals of existing product orders.

Primary "product orders" constitute "core" risk management contract transaction type (FIG. 19 provides a summary flow chart, and the document text provides a detailed flow chart and description of the processing of this transaction type).

Primary product orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the terms Beta (X)", the term Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is pre-pared to "pay" for their defined product; miscellaneous other dimensions of the ordering party's needs, and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received). Upon its receipt, all of this information is written to—and subsequently processed from—the PORD NEW.

Three sub-processes are involved in processing primary product orders—order authorisation, order matching, and matched order confirmation. In the case of the anticipated most typical form of order, termed a "normal-automatic" primary product order these sub-processes function as follows:

The primary product order authorisation sub-process verifies that all orders contain data appropriate to the product being sought and that each ordering party is accurately identified and credentialled (this sub-process draws principally on the data file, PPRODUCT).

The primary product order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential counterparties, individual potential-counterparty "pricing" calculations, and counterparty selection.

The "of short-listing of potential counterparties" sub-process component establishes a list of potential counterparties (if any) willing to offer the product sought by the ordering party, upon their receipt from the ordering party of a consideration they deem to be appropriate (this sub-process draws principally on the data-file, PDEAL LIST).

The individual potential-counterparties pricing calculations sub-process component utilises the above-described pricing parameters pre-specified by each short-listed potential counterparty to calculate the "bid" each of them is prepared to make on the ordering-party's product order (or part thereof), and to add these to the potential counterparties short-list file (this sub-process draws principally on the data-file, PSEL PRICE).

The "counterparty selection" sub-process component extracts from the above-described "potential-counterparties short-list" file the best possible counterparty(ies) for the ordering party's transaction, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched order is deemed to be in existence (this sub-process draws principally on the data-file, PSEL LIMIT).

The matched order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the contract, including confirmation of the product ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required contract consideration (and possible other applicable fees). Automatic approvals of contracts are made the CONTRACT APP electronically transferring resources records in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty (See Appendix H for a description of the consideration/ entitlement "payment" process). In turn, automatic updates of the counterparty's matching constraints maintained in the file PSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, PORD QUEUE, for subsequent match attempts;

matched and confirmed order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the file PORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process principally on the data-file, ADMIN), records of this being written to the file PORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 3

Process 3 handles the receipt and processing of "secondary" risk management contract transactions. Like "primary" risk management contracts, "secondary" risk management contracts are of multiple types various sub-processes of Process 3 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

"Secondary product orders" constitute the core "secondary" risk management contract transaction type (FIG. 20 provides a summary flow chart of the processing of this transaction type).

"Secondary" product orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract; the potential acquiring party's interest or otherwise in being granted credit by offering parties for the yet-to-be-determined contract acquisition amount; the acquiring party's interest or otherwise in availing themselves of the possible netting and other features of the APP concerned; the acquisition "price" range within which the potential acquiring party is prepared to "pay" for the contract they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file SORD NEW.

Three sub-processes are involved in processing secondary product orders—order authorisation, order matching, and matched order confirmation. In case of the anticipated most typical form of order, termed a "normal-automatic" secondary product order these sub-processes function as follows:

The secondary product order authorisation sub-process verifies that all orders contain data appropriate to the contract sought and that each potential acquiring party is accurately identified and credentialled (this sub-process draws principally on the data-file, SPRODUCT).

The secondary product order matching sub-process locates sought-after contract records and, based on the contents of these records, determines whether a "sale" of the position of the specified stakeholder in the contract to the potential acquiring party is possible—in particular, whether the acquisition "price" range within which the potential acquiring party has specified it is prepared to "pay" for the position of the specified current stakeholder is equal to, or in excess of, the "allowable sale price" figure prespecified by the applicable contract stakeholder. If a contract "sale" is found to be possible, and there being no requirements for manual-approval intervention by any relevant stakeholder, a "match" is deemed to have occurred.

The secondary product matched order confirmation sub-process effectively sources, automatically, the positive agreement of all affected stakeholders to the contract position "sale", including confirmation of the contract acquiring party's ability to immediately pay (or be granted current stakeholder credit, or acquiring party guarantor credit, for) the required "sale price" consideration (and possible other applicable fees). Automatic approvals of such "sales" are made by the CONTRACT APP electronically transferring resources recorded in the acquiring party's applicable consideration/entitlement transfer entity account to the account of the applicable current contract stakeholder.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, SORD QUEUE, for subsequent match attempts; matched and confirmed order transactions are confirmed by the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN), required records being written to the file SORD CONF for further "back-office" processing as required; and rejected order transactions are similarly notified to the relevant CONTRACT APP stakeholders (again, this process drawing principally on the data-file, ADMIN), required records being written to the file SORD REJ for further "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 4

Process 4 handles the receipt and processing of "derivative-primary" risk management contract transactions. Like "primary" risk management contracts, "derivative-primary" risk management contracts are of multiple types; various sub-processes of Process 4 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and existing product order withdrawals.

"Product option orders" is one illustrative "derivative-primary" risk management contract transaction type (FIG. 21 provides a summary flow chart of the processing of this transaction type).

"Derivative-primary" product option orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of a single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the term "Beta (X)", the term "Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract option consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is prepared to "pay" for their defined product option; miscellaneous other dimensions of the ordering party's needs, and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received). Upon its receipt, all of this information is written to—

and subsequently processed from—the file DPORD NEW.

Three sub-processes are involved in processing derivative-primary product orders order authorisation, order matching, and matched order confirmation. In the case of the most likely form of the above-mentioned illustrative option order, termed a "normal-automatic" derivative-primary product option order these sub-processes function as follows:

The primary product option order authorisation subprocess verifies that all orders contain data appropriate to the product option being sought and that each ordering party is accurately identified and credentialled (this process draws principally on the data-file, DPPRODUCT).

The primary product option order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential counterparties, individual potential option-counterparty "pricing" calculations, and option-counterparty selection.

The "short-listing of potential option-counterparties" sub-process component establishes a list of potential option-counterparties (if any) willing to offer the product option sought by the ordering party, upon their receipt from the ordering party of an option consideration they deem to be appropriate (this sub-process draws principally on the data-file, DPDEAL LIST).

The "individual potential option-counterparties pricing calculations" sub-process component utilises the above-described pricing parameters prespecified by each short-listed potential option-counterparty to calculate the "bid" each of them is prepared to make on the ordering party's product option order (or part thereof), and to add these to the potential option-counterparties short-list file (this sub-process draws principally on the data-file, DPSEL PRICE).

The "option-counterparty selection" sub-process component extracts from the above-described "potential option-counterparties short-list" file the best possible counterparty(ies) for the ordering party's trans-action, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and the price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched option order is deemed to being existence (this sub-process draws principally on the data-file, DPSEL LIMIT).

The matched option order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the options contract, including confirmation of the product-option-ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required option product consideration (and possible other applicable fees). Automatic approvals of contracts are made by the CONTRACT APP electronically transferring resources recorded in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty. In turn, automatic updates of the option-counterparty's matching constraints maintained in the file DPSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched option-order transactions are written to the file, DPORD QUEUE, for subsequent match attempts; matched and confirmed option-order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the reference file DP MSTR, and the file DPORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process drawing principally on the data-file, ADMIN), records of this being written to the file DPORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

If/when and option-holder wishes to exercise its option over a pre-established contract, it does so by appropriately notifying the CONTRACT APP which, in turn, retrieves the contract record from DPMSTR, effect the necessary additional consideration payments, and writes a new record to PORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 5

Process 5 handles the receipt and processing of "derivative-secondary" risk Management contract transactions. Like "secondary" risk management contracts, "derivative-secondary" risk management contracts are of multiple types; various sub-processes of Process 5 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

"Product option orders" is an illustrative "derivative-secondary" risk management contract transaction type (FIG. 22 provides a summary flow chart of the processing of this transaction type).

"derivative-secondary" product option orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract (in relation to which an option is to be purchased or sold); the potential acquiring party's interest or otherwise in being granted credit by offering parties for the yet-to-be-determined option contract acquisition amount; the acquiring party's interest or otherwise in availing itself of the possible net-ting and other feature of the APP concerned; the acquisition "price" range within which the potential acquiring party is prepared to "pay" for the contract option they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file DSORD NEW.

The subprocesses involved in the processing of derivative-secondary product option order are essentially a combination of the processes described above in the case of secondary product orders (Process 3) and derivative-primary product option orders (Process 4). At the completion of the matching process, matched orders are written to the reference file DSMSTR and the file DSORD CONF for subsequent back office processing.

If/when an option holder wishes to exercise its option over a pre-established contract, it does so by appropriate notifying the CONTRACT APP which, in turn, retrieves the contract record from DSMSTR, effects the necessary additional consideration payments, and writes a new record to SORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 6

Process 6 handles the "back office" management of "matched/confirmed" primary, secondary, derivative-primary, and derivative-secondary risk management contract transactions and transactions handled by Processes 7–9. The process incorporates multiple sub-processes, collectively accessing multiple data files (FIG. 23); primary risk management contract back office processing; secondary risk management contract back office processing; derivative-primary risk management contract back office processing; derivative-secondary risk management contract back office processing; "Process 7" transactions back office processing; "Process 8" transactions back office processing; and "Process 9" transactions back office processing.

In relation to the back-office management of confirmed/matched primary risk management contracts—a number of sub-processes are involved, including: Receipt of the previous operating day's "matured-contract actual product event value" sub-process; "Start-of-day PAYACC management" sub-process; Contract maturity management sub-process; Confirmed contract processing sub-process; Information compilation and distribution sub-process; Information extraction from primary orders sub-process; Contract valuation sub-process; Contract collateralisation payments sub-process; System Access and usage fee determination and payments sub-process; Bilateral obligations netting sub-process; Multilateral obligations netting sub-process; Bilateral payments netting sub-process; multilateral payments netting sub-process; and "end-of-day PAYACC management" sub-process.

Receipt of the previous operating day's "matured-contract actual product event value" details. This sub-process is flowcharted in FIG. 24; it involves the applicable CONTRACT APP receiving "matured-contract actual product event value" details from the relevant product sponsors (external to INVENTCO). The primary data-file, MAT PROD VALUES, is updated with this information. The support data-files, ADMIN, HISTORY, and INFO are similarly updated with applicable information.

"Start-of-day" PAYACC management. This sub-process is flowcharted in FIG. 25; it involves the applicable CONTRACT APP receiving consideration/entitlement "actual account" opening-balances from participating consideration/entitlement transfer entities (external to INVENTCO) (see Process 7 for details). The primary data-files, PAYACC SHADOW and PAYACC FINAL are updated with this information. The support data-files, HISTORY, INFO and ADMIN, are similarly updated with applicable information.

Contract maturity management. This subprocess is flowcharted in FIG. 26; it involves the applicable CONTRACT APP determining and giving effect to primary and related entitlement-transfers to/from applicable CONTRACT APP stakeholders, applicable other INVENTCO stakeholders, where such transfers are principally reflected in entries to the data-file, PAYACC SHADOW. CONTRACT APP determines and gives effect to these transfers, principally by drawing upon product/contract information maintained in the data files, INTREG, MAT PROD VALUES, COLLAT, CREDIT MGMT, BILAT OBLIG NET, and MULTILAT OBLIGNET. These data-files are appropriately updated in the process as are the support data-files, ADMIN, HISTORY TAX/SUB, PAYACC SHADOW and INFO.

Confirmed contract processing. This sub-process, flowcharted in FIG. 27, operates continually throughout each operating day. Details of new matched/confirmed contracts are read from the file PORD CONF and are then time-stamped and written to the file INTREG as two records—one record pertaining to the contract ordering party and the other to the contract counterparty. The support data files, INFO, ADMIN, and HISTORY are appropriately updated in the process.

Information compilation and distribution. This sub-process, flowcharted in FIG. 28, operates continually (beyond a defined operating day), drawing on the data-file INFO. As already described, INFO is updated continually as CONTRACT APP and other INVENTCO events occur, including pertinent AXSCO message information written in the first instance to HISTORY. All relevant INVENTCO stakeholders have access to preauthorised parts of INFO.

Information extraction from primary orders. This sub-process, flowcharted in FIG. 29, is effected after the completion of the defined operating day. Essentially, it involves the single task of processing the data-file, HISTORY, to yield pertinent information for the data-file INFO. One of the most important items of information drawn from HISTORY is (confidential) information on all of the prior day's potential counterparty consideration bid parameters, in particular the data items termed "assessed probabilities of occurrence". This information yields "market" information for the subsequent contract valuation sub-process.

Contract valuation. This sub-process, flowcharted in FIG. 30, draws principally upon the above-described "markets" information previously written to INFO. Pertinent data from this file is "applied against" all outstanding contracts maintained in INTREG, thereby yielding updated "future product value (FPV)", "expected value" and "distribution" value information for all contracts and, from this, revaluations of all future entitlement "expected values" and "distribution" values. All these revaluation figures are maintained in INTREG with applicable information also being written to INFO and HISTORY.

Contract collateralisation payments. This sub-process, flowcharted in FIG. 31, draws principally on the data-file INTREG. Following the contract valuation process, this collateralisation process involves relevant INTREG records being read and, depending (amongst other things) on the precalculated "present value" of the expected future entitlement associated with each relevant contract, a calculated portion of the present value of the expected future consideration amount is debited or credited to the PAYACC SHADOW file of the applicable collateralisation trustee entity, and the product ordering party and/or counterparty as is applicable.

Generally, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a negative contract value, and if this negative value exceeds the prior contact valuation figure, the applicable entity's trust account in credited with the funds difference, with the entity's own consideration/entitlement transfer entity account being debited correspondingly. If this negative value does not exceed the prior contract valuation figure, the applicable entity's trust account is debited with the funds difference, with the entity's own consideration/entitlement transfer entity account being credited correspondingly. On the other hand, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a positive contract value, the only collateralisation payment adjustment called for is one in which all funds (if any) in the applicable entity's trust account are transferred to the entity's own consideration/entitlement transfer entity account. In each of the above-described cases, a record of all entries effected is written to the data-file, COLLAT, and a subset of this information is written to the data-files HISTORY and INFO.

System Access and usage fee determination and payments. This subprocess, flowcharted in FIG. 32, deals with the determination and payment of system access and usage fees (as distinct from contract maturity date fee payments). The function draws principally on the data-files ADMIN, and HISTORY. Fee payment parameters are maintained in data-file ADMIN. These parameters are applied against the day's new records already written to HISTORY. Debits and credits for fees so determined are written to PAYACC SHADOW with summary information written to INFO and HISTORY.

Bilateral obligations netting. This subprocess, flowcharted in FIG. 33, effectively maintains an up-to-date matrix of the present values of expected future entitlement (and other) obligations between pairs of participating ordering parties and counter-parties (as well as other participating CONTRACT APP and INVENTCO stakeholders), continually adjusted on the basis of required current consideration, entitlement and other payments/receipts as they occur. As required, the function updates the above-described matrix in two stages. First, with the most recent contract revaluation figures contained within INTREG. And second, with the end-of-day payment/receipt amounts contained within PAYACC SHADOW. Consideration/entitlement transfer entity transfers from/to applicable entities are determined (according to the application-promoter specified parameters for so doing) on the basis of whether or not any/all of the adjusted bilateral present value figures are in excess of their allowable limits. These entries are written to PAYACC SHADOW, with the data-files BILAT OBLIG NET, INTREG, HISTORY, and INFO being subsequently updated.

Multilateral obligations netting. This subprocess, flowcharted in FIG. 34, is essentially the same as the bilateral netting function except that a specified "clearing/trustee" entity is effectively interposed between all bilateral counterparties and, as such, netted obligations are only between the specified "clearing house/trustee" entity and each participating entity.

Bilateral payments netting. This subprocess, flowcharted in FIG. 35, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bilaterally netted payments/receipts based on records contained in the data-file, PAYACC SHADOW. Single netted payment/receipt figures are then rewritten to PAYACC SHADOW, with the data-files BILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

Multilateral payments netting. Like bilateral payments netting, this subprocess, flowcharted in FIG. 36, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bi-laterally netted payments/receipts to/from the applicable "clearing house/trustee" entity based on records contained in the dats-file, PAYACC SHADOW. Single netted payment/receipt figures (to/from the "clearing house/trustee" entity) are then rewritten to PAYACC SHADOW, with the data-files MULTILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

"End-of-day" PAYACC management. This subprocess, flowcharted in FIG. 37, involves a three-stage process. First, the preparation of inter-consideration/ entitlement transfer entity "balancing" transactions. Second, the transfer of the final contents of the PAYACC SHADOW data-file to the data-file, PAYACC FINAL. And third, the electronic transmission of the contents of PAYACC FINAL to the applicable consideration/entitlement transfer entities (external to INVENTCO). In turn, the subsidiary data-files, ADMIN, HISTORY, and INFO are up-dated.

Process 7

Process 7 handles non-CONTRACT APP-related obligation transfers between applicable INVENTCO stakeholders, that is, the transfer of ownership title over "assets" registered by INVENTCO—typically matched/confirmed contracts (recorded as CONTRACT APP INTREG records). and consideration/entitlement fransfer entity resources (recorded as PAYACC records). Both of the above-mentioned items have value to their holder. This process enables holders of these items to assign or lend any portion of their holdings to others at their will through initiating the appropriate transactions as NCAROT TRANS. The process accesses a relatively small number of data files (see FIG. 38). NCAROT TRANS received result in appropriate updates to the primary data-files, PAYACC SHADOW and INTREG. In turn, the subsidiary data files, HISTORY, ADMIN and INFO are updated.

Process 8

Process 8 (flowcharted in FIG. 39) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to specialist systems to assist them decide how best to interface with one or more aspects of INVENTCO. In the case of CONTRACT APP stakeholders, the most likely users of this process, one collection of such specialist systems are termed "decision support systems". The purpose of these systems is to guide a user-stakeholder as to how it should react to/deal with the continually changing circumstances within the CONTRACT APP with which they are dealing. Different clusters of systems are applicable for different CONTRACT APP stakeholders. These systems involve a hierarchy of potentially any number of value-added components.

An example of one such system, useful to primary product ordering parties, is a system which helps an ordering party determine which of its prespecified, but as yet unmatched, orders it should withdraw and which of its potential new product orders it should submit. This system is in the form of a "utility optimization" mechanism which seeks to identify the best possible composition of outstanding orders (and thus, which existing, unmatched orders should be withdrawn and which new orders should be submitted) based on two things. First, an objective function which seeks to minimize the difference between a weighted sum of actual and desired values of a series of attributes (involving single or multiple products, covering the ordering party's "real business exposure" to each product, the ordering party's portfolio of contracts which have been "matched" but are not yet confirmed, orders which have been submitted but not yet matched, and potential yet-to-be-submitted orders (collectively termed "buyer's objective portfolio"), these attributes including, amongst other things: the "expected value" of the objective portfolio; the "standard deviation" of the objective portfolio; the "incremental cash outflow" attribute of the objective portfolio; the "maximum absolute loss" attribute of the objective portfolio; the "expected loss" attribute of the objective portfolio; the "implied minimum return on investment" of the objective portfolio; and the "implied expected return on investment" of the objective portfolio. And second, a series of constraints specifying, amongst other things: the required "minimum values" of each objective function attribute; and required minimum product-shares in the ordering party's overall product portfolio. The mathematical form of this "optimization" could take any of a number of alternative forms.

An optimization mechanism similar to the one described above can also aid potential counterparties in defining their pricing parameters for application against incoming product orders.

Effectively, systems of the above-described type are collectively maintained as a software "library" within applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entities independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, SSA, TRANS. These requests result in the appropriate records in the file SSA being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link to INVENTCO. Appropriate records of the utilization of SSA records are written to the data-files HISTORY, ADMIN and INFO.

Process 9

Process 9 (flowcharted in FIG. 40) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to a range of INVENTCO-facilitated value added services. These services can include: accounting, reconciliation, and information services; value added information reseller services; financial services of multiple types; and data processing and telecommunications services. Effectively, software relating to these services is maintained as a software "library" within the applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entries independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, VAS TRANS. These requests in the appropriate records in the file VAS being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link with

INVENTCO. Appropriate records of the utilization of VAS records are written to the data-files HISTORY, ADMIN and INFO.

Process 2 Variables and Data Files

Listed below is the file name and description therefor.

Order Data Fields

OID Unique identification assigned by CONTRACT APP to every new order submitted.

BID Ordering part identification.

BREF Ordering party's own reference for this order.

PID Order filed specifying the required product.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from. Implied is the account consideration/entitlement, currency, national currency.

ACC ENTITL The ordering party account the contract entitlement is to be paid into. Implied is the account consideration/entitlement, currency, national currency.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining un-matched.

OPRICE Price calculated and selected for this order (this value will be the matching price).

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

DCID Defined circumstances identification.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements.

Counterparty Short List Arrays

PRICEFUNC(SID) Pricing function: function type and associated parameters.

ELFUNC(SID) Expected loss determination function: function type and associated parameters.

EVFUNC(SID) Expected value determination function: function type and associated parameters.

CR(SID) Commission rate to be used for the current defined circumstances.

DR(SID) Discount rate to be used for the current defined circumstances.

PRICE(SID) price calculated by each counterparty.

EL(SID) Expected loss calculated for the current order by each counterparty.

AL(SID) Absolute loss calculated for the current order by each counterparty.

EV(SID) Expected values determined for the current order by each counterparty.

MCC(SID) maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC(SDID) maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1(SID) Order expected loss limit.

ELL2(SID) Expected loss limits set by the counterparty for the product.

ELL3(SID) Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4(SID) Expected loss limits set by the counterparty for the same month maturity products.

ELL5(SID) Expected loss limits set by the counterparty for orders in all products.

CEL2(SID) Current accumulated expected losses for the product.

CEL3(SID) Current accumulated expected losses for equivalent maturity date products.

CEL4(SID) Current accumulated expected losses for same month maturity products.

CEL5(SID) Current accumulated expected losses for orders in all products.

ALL1(SID) Absolute loss limit function for each contract.

ALL2(SID) Absolute loss limit function set for the product.

CAL2(SID) Current absolute limit function accumulated for the product.

EVL1(SID) Expected value limit on each order.

C-C/EDXCHANG(SID) Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG(SID) Counterparty currency exchange rates which convert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG(SID) Counterparty consideration/entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC ENTITL into the product's consideration denomination.

E-CXCHANG(SID) Counterparty currency exchange rates which convert the ordering party's currency of ACC ENTITL into the product's denominated currency.

E-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

Miscellaneous Variables

BPRICE Best price selected from the PRICE(SID) array.

SID The currently selected or viewed counterparty identification.

INDEX Index counter variable required for calculating order prices.

P1 Value calculated by a pricing function at an index point.

P2 Value calculated by a pay-off function at an index point.

Master Files

File Description/Contents

PORD NEW Holds details of all new orders submitted by ordering parties.

BID Ordering party identification.

BREF Ordering party's own reference for this order.

PID Order field specifying the required product.

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from.

ACC C/ED The ordering party account consideration/ entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

ACC ENTITL The ordering party the contract entitlement is to be paid into.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining unmatched.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements.

PORD QUEUE This master filed details of orders which have already been authorised, and have attempted to match once before. Fields as in ORD NEW plus some additional fields:

OID Unique identification assigned by P-CONTRACT to every new order submitted.

PMAT Product maturity date.

C/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

DCID Defined circumstances identification.

PORD REJ All rejected orders reside in this field. Fields as in ORD QUEUE plus some additional fields:

ERRCODE Error code indicating why the order was rejected.

PORD CONF When an order is matched and fully confirmed, full details are stored in this master file. Fields as in ORD QUEUE plus some additional fields:

OPRICE Price calculated and selected for this order. This value will be the matching price.

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

PPRODUCT This master file holds information (definition details) about each product known to the system:

PID Product identification.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

PDEAL LIST This file holds a list of the ordering party/product/counterparty tuples of allowable deals to occur. Thus by specifying an ordering party (BID) and product (PID), a list of counterparties who are prepared to enter into a deal with the ordering party/product combination, can be obtained:

BID Ordering party identification

PID Product identification

SID Counterparty identification

ANON All stakeholder identifications requiring anonymous confirmation.

MANUAL All stakeholder identifications requiring manual authorisation

PSEL DC This file allows counterparties to define identifications for sets of potential order parameters.

Any order data field can be used to define an order.

Each defined circumstance identification is then used to set unique pricing parameters:

DCID Defined circumstances identification.

BID Ordering party identification

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from.

ACC ENTITL The ordering party account the contract entitlement is to be paid into.

DTID Deal type identification.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PSEL PRICE Contains all counterparty pricing parameters, including commission rates, discount rates and exchange rates:

SID Counterpart identification

PID Product identification

DCID Defined circumstances identification

PRICEFUNC Pricing function: function type and associated parameters.

CR Commission rate to be used for the current ordering party in the current product.

DR Discount rate to be used for the current ordering party in the current product.

C-C/EDXCHANG Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG Counterparty currency exchange rates which convert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC ENTITL into the product's consideration denomination.

E-CXCHANG Counterparty currency exchange rates which convert the ordering party's currency of ACC CONSID into the product's denominated currency.

E-NCXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

PSEL LIMIT Holds all counterparty portfolio limits and current accumulated exposures in the various mathematical forms allowed by the system:

SID Counterparty identification

PID Product identification

DATE Product maturity date.

MCC Maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC Maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1 Order expected loss limit.

ELL2 Expected loss limits set by the counterparty for the product.

ELL3 Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4 Expected loss limits set by the counterparty for same month maturity products.

ELL5 Expected loss limits set by the counterparty for orders in all products.

CEL2 Current accumulated expected losses for the product.

CEL3 Current accumulated expected losses for equivalent maturity date products.

CEL4 Current expected losses for same month maturity products.

CEL5 Current accumulated expected losses for orders in all products.

ALL1 Absolute loss limit function for each contract.

ALL2 Absolute loss limit function set for the product.

CAL2 Current absolute limit function accumulated for the product.

EVL1 Expected value limit on each order.

PAYACC Payment accounts for all registered stakeholders (inc. balances and previous SHADOW transactions), are stored in this master file:

ID Stakeholder identification.

NO Account number.

ACC C/ED The ordering party account consideration/ entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

BALANCE Available funds.

GID Stakeholder identification guaranteeing the account.

Risk Management Contracts

Risk management contracts is a term used to refer to one type of contractual obligation which can be, but does not need to be, traded/exchanged/transferred, and subsequently processed and settled, using an INVENTCO system. Risk management contracts consist of "primary" isk management contracts; "secondary" risk management contracts; "derivative-primary" risk management contracts; and "derivative-secondary" risk management contracts.

"Primary" risk management contracts can be "simple" and "complex" in nature ("simple" contracts being derivatives of "complex" contracts).

A "simple" primary risk management contract is a tradeable or untradeable contract conveying an obligation on an entity, upon that entity being granted a consideration another entity (or a pledge to be granted a consideration by the other entity), to make an entitlement to that other entity depending on the value of a defined phenomenon, determined at a defined time in the future.

A "complex" primary risk management contract is a tradeable or untradeable contract conveying an obligation on either or both of two entities, upon one entity [usually] being granted a consideration by the other entity (or accepting a pledge to be granted a consideration by the other entity), to make an entitlement to pay/receive an entitlement from on another, depending on the value of a defined phenomenon, determined at a defined time in the future. A "complex" contract may, in turn, be "basic" or "advanced" in nature: a "complex-basic+ contract being one that does not involve ordering party and/or matched order counterparty "collateralisation payments" to a third-party trustee or clearing entity during the life of a contract; and a "complex-advanced" contract being one that does involve ordering party and/or matched order counterparty "collateralisation payments" to a third-party trustee or clearing entity during the life of the contract.

"Secondary" risk management contracts are pre-existing "primary" risk management contracts offered for trade (individually or as a portfolio) by a "risk-counterparty" stakeholder to the underlying contract.

"Derivative-primary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on specified, but yet-to-be-established, primary risk management contracts.

"Derivative-secondary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on pre-existing primary risk management contracts (which may have been traded since they were first established), including instruments based on: specified, but yet-to-be established, secondary risk management contracts; and the intended tertiary trading/exchange/transfer of specified, established, secondary risk management contracts.

I claim:

1. A data processing system to enable the exchange of an obligation between parties, the system comprising:

a data storage unit having stored therein information about a shadow credit record and shadow debit record for a party, independent from a credit record and debit record maintained by an exchange institution; and a computer, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said shadow credit record and/or said shadow debit record in order to effect an exchange obligation arising from said transaction, allowing only those transactions that do not result in a value of said shadow debit record being less than a value of said shadow credit record; and (c) generate an instruction to said exchange institution at the end of a period of time to adjust said credit record and/or said debit record in accordance with the adjustment of said shadow credit record and/or said shadow debit record, wherein said instruction being an irrevocable, time invariant obligation placed on said exchange institution.

2. The data processing system of claim 1, wherein said exchange obligation arises out of a transaction linked to a share price.

3. The data processing system of claim 1, wherein said exchange obligation arises out of a transaction linked to a weather event.

4. The data processing system of claim 1, wherein said exchange obligation arises out of a transaction linked to a market event.

5. The data processing system of claim 1, wherein said exchange obligation involves the transfer of shares in financial or physical assets.

6. The data processing system of claim 1, wherein said exchange obligation involves a wager.

7. The data processing system of claim 1, wherein said exchange obligation involves the transfer of a commodity.

8. The data processing system of claim 1, wherein said exchange obligation arises out of a transaction involving money for goods, services, promises, credits or warrants.

9. The data processing system of claim 1, wherein said period of time is a part of a day.

10. The data processing system of claim 1, wherein each said adjustment takes place in chronological order.

11. The data processing system of claim 1, wherein said instruction represents one or more credits and/or one or more debits netted throughout a period for said party with respect to transactions of that period of time.

12. The data processing system of claim 1, wherein said exchange institution is a credit card company.

13. The data processing system of claim 1, wherein said exchange institution is a debit card company.

14. The data processing system of claim 1, wherein said exchange institution is a bank.

15. The data processing system of claim 1, wherein said exchange institution is a central bank.

16. The data processing system of claim 1, wherein said exchange institution is a guarantor offering credit to one or more parties involved in said exchange obligation.

17. The data processing system of claim 1, wherein said exchange institution is a party offering credit to

one or more other parties involved in said exchange obligation.

18. The data processing system of claim 1, wherein said exchange obligation arises out of a currency exchange transaction.

19. The data processing system of claim 1, wherein two or more exchange institutions operate in different time zones.

20. The data processing system of claim 1, wherein two or more exchange institutions have different account processing cycles.

21. The data processing system of claim 1, wherein said transaction arises out of a collateralization payment obligation.

22. The data processing system of claim 1, wherein said data storage unit has stored therein a balance for said shadow credit record and/or said shadow debit record obtained from said exchange institution.

23. The data processing system of claim 1, wherein at least one credit record and one debit record is maintained with another exchange institution.

24. The data processing system of claim 23, wherein said another exchange institution operates in a different time zone than said exchange institution.

25. The data processing system of claim 23, wherein said another exchange institution has a different account processing cycle than said exchange institution.

26. The data processing system of claim 1, wherein said exchange institution is a non-bank clearing house or depository.

27. The data processing system of claim 1, further comprising means for allowing said party to acquire an item from another party, wherein the exchange obligation relates to said item.

28. A data processing system to enable the exchange of an obligation between parties, the system comprising:

a data storage unit having stored therein information about a shadow record for a first party, independent from an account maintained by an exchange institution; and

a computer, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said shadow record in order to effect an exchange obligation arising from said transaction, allowing only those transactions that do not result in a value of said shadow record being less than a zero; and (c) generate an instruction to said exchange institution at the end of a period of time to adjust said account in accordance with the adjustment of said shadow record, wherein said instruction being an irrevocable, time invariant obligation placed on said exchange institution.

29. The data processing system of claim 28, wherein the account pertains to shares in financial or physical assets.

30. The data processing system of claim 28, wherein the account pertains to participation rights in wagers.

31. The data processing system of claim 28, wherein the account pertains to goods.

32. The data processing system of claim 28, wherein the account pertains to services.

33. The data processing system of claim 28, wherein the account pertains to central bank exchange settlement account deposits.

34. The data processing system of claim 28, wherein the account pertains to financial instrument deposits.

35. The data processing system of claim 28, wherein the account pertains to credit extended to/from a party or to/from a guarantor of a party.

36. The data processing system of claim 28, wherein the account includes an overdraft or line-of-credit with said exchange institution.

37. The data processing system of claim 28, wherein said first party holds one or more accounts with more than one exchange institution.

38. The data processing system of claim 28, wherein the system and exchange institution are legally and/or geographically domiciled in different countries.

39. The data processing system of claim 28, wherein said first party is a buyer and a second party is a seller.

40. The data processing system of claim 28, further comprising debiting and/or crediting said shadow record based on said transaction.

41. The data processing system of claim 28, wherein said exchange obligation arises out of a collateralization payment obligation.

42. The data processing system of claim 28, wherein said transaction involves a weather event.

43. The data processing system of claim 28, wherein said transaction involves a market event.

44. The data processing system of claim 28, wherein said transaction involves a wager.

45. The data processing system of claim 28, wherein said transaction involves an exchange of money for goods, services, promises, credits or warrants.

46. The data processing system of claim 28, wherein said exchange institution is a credit card company.

47. The data processing system of claim 28, wherein said exchange institution is a debit card company.

48. The data processing system of claim 28, wherein said exchange institution is a party offering credit to one or more other parties involved in said exchange obligation.

49. The data processing system of claim 28, wherein said data storage unit has stored therein a balance for said shadow record obtained from said exchange institution.

50. The data processing system of claim 28, wherein a second party maintains an account with an ex-change institution that is different from said exchange institution that maintains the account for said first party.

51. The data processing system of claim 50, wherein two or more exchange institutions operate in different time zones.

52. The data processing system of claim 50, wherein two or more exchange institutions have different ac-count processing cycles.

53. The data processing system of claim 28, wherein said period of time is a part of a day.

54. The data processing system of claim 28, wherein said exchange obligation arises out of a currency exchange transaction.

55. The data processing system of claim 28, wherein said instruction represents adjustments netted throughout a period of time.

56. The data processing system of claim 28, wherein said exchange institution is a bank.

57. The data processing system of claim 28, wherein said exchange institution is a central bank.

58. The data processing system of claim 28, wherein two or more exchange institutions have different account processing cycles.

59. The data processing system of claim 28, further comprising means for allowing said first party to acquire an item from another party, wherein the exchange obligation relates to said item.

60. A data processing system to enable the exchange of a payment obligation of a currency exchange transaction between banks, the system comprising:

a data storage unit having stored therein information about a shadow credit record and shadow debit record for a bank, independent from a credit record and debit record maintained by a central bank; and

a computer, coupled to said data storage unit, that is configured to (a) receive a currency exchange transaction; (b) electronically adjust said shadow credit record and/or said shadow debit record in order to effect an exchange obligation arising from said currency exchange transaction, allowing only those currency exchange transactions that result in a net positive shadow record balance; and (c) generate an instruction periodically to said central bank to adjust said credit record and/or said debit record in accordance with the adjustment of said shadow credit record and/or said shadow debit record, wherein said instruction being an irrevocable, time invariant obligation placed on said central bank.

61. The data processing system of claim 60, wherein each said adjustment takes place in chronological order.

62. The data processing system of claim 60, wherein said data storage unit has stored therein a balance for said shadow credit record and/or said shadow debit record obtained from said central bank.

63. The data processing system of claim 60, wherein said instruction is provided at an end of a processing cycle.

64. A data processing system to enable a purchase between a buyer and a seller, the system comprising:

a data storage unit having stored therein information about a shadow record for a buyer or a seller, independent from an account maintained by a bank; and

a computer, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said shadow record in order to effect a purchase arising from said transaction between said buyer and said seller, allowing only those purchases that do not result in a value of said shadow record being less than zero; and (c) generate an instruction to said bank at the end of a period of time to adjust said account in accordance with the adjustment of said shadow record, wherein said instruction being an irrevocable, time invariant obligation placed on said bank.

65. The data processing system of claim 64, wherein said data storage unit has stored therein a balance for said shadow record obtained from said bank.

66. The data processing system of claim 64, wherein said period of time is a part of a day.

67. The data processing system of claim 64, further comprising means for allowing said buyer to acquire an item from said seller, wherein the purchase relates to said item.

68. A data processing system to enable the exchange of an obligation between parties, the system comprising:

a data storage unit having stored therein (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

a computer, coupled to said data storage unit, that is configured to (a) receive a transaction; (b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and (c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

69. The data processing system of claim 68, wherein said first and/or second exchange institution is a central bank.

70. The data processing system of claim 69, wherein said exchange obligation involves currency.

71. The data processing system of claim 70, wherein said first exchange institution and said second exchange institution operate in different time zones.

72. The data processing system of claim 68, wherein said first exchange institution and said second exchange institution are the same.

73. The data processing system of claim 68, wherein said second account and said fourth account are the same account.

74. The data processing system of claim 68, wherein said exchange obligation involves currency.

75. The data processing system of claim 68, wherein said first and/or second exchange institution is a non-bank clearing house or depository.

76. The data processing system of claim 68, wherein adequate value requires that said first account and/or said third account have a positive balance.

77. The data processing system of claim 68, wherein said period of time is a part of a day.

78. The data processing system of claim 68, wherein said instruction to said first exchange institution and/or said second exchange institution represents adjustments to said first and said third account netted throughout a period of time.

79. The data processing system of claim 68, further comprising means for allowing said first party to acquire an item from said second party, wherein the exchange obligation relates to said item.

80. A data processing system to enable a purchase between a first party and a second party, the system comprising:

a data storage unit having stored therein information about a first account for the first party or the second party, independent from a second account maintained by a bank; and

a computer, coupled to said data storage unit, configured to enable the purchase, including (a) electronically adjusting said first account in order to effect the purchase between said first party and said second party, allowing only those purchases that do not result in a value of said first account being less than zero; and (b) generating an instruction to said bank to adjust said second account in accordance with the adjustment of said first account, wherein said instruction being an irrevocable, time invariant obligation placed on said bank.

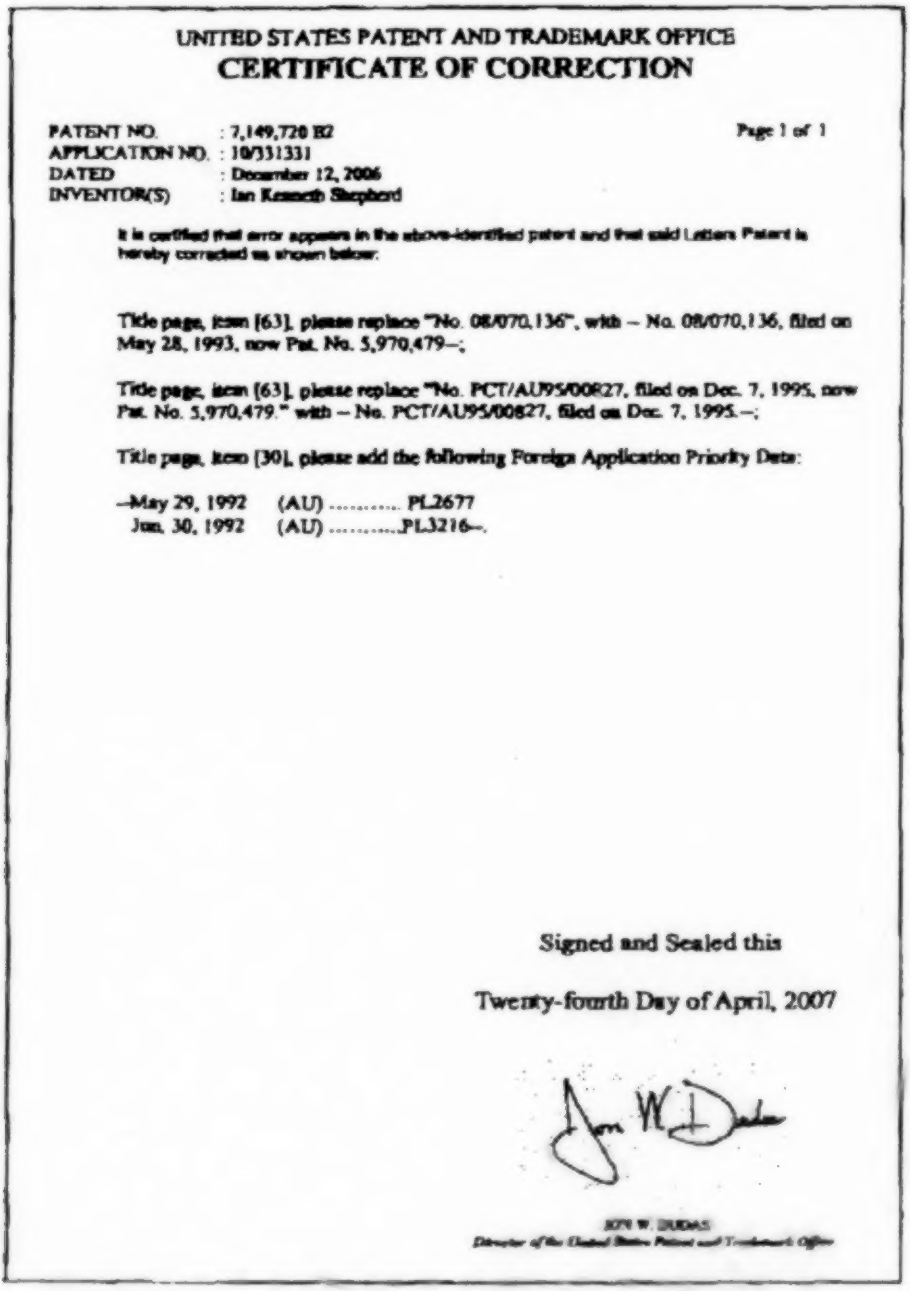
81. The data processing system of claim 80, wherein said data storage unit has stored therein a balance for said first account obtained from said bank.

82. The data processing system of claim 80, wherein said instruction is generated at the end of a day.

83. The data processing system of claim 80, wherein said first account holds funds for said first party and said second party.

84. The data processing system of claim 80, further comprising means for allowing said first party to acquire an item from said second party, wherein said purchase relates to said item.

* * * * *



UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,149,720 B2 Page 1 of 1
APPLICATION NO. : 10/331331
DATED : December 12, 2006
INVENTOR(S) : Ian Kenneth Shepherd

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page, item [63], please replace "No. 08/070,136", with – No. 08/070,136, filed on May 28, 1993, now Pat. No. 5,970,479–;

Title page, item [63], please replace "No. PCT/AU95/00827, filed on Dec. 7, 1995, now Pat. No. 5,970,479." with – No. PCT/AU95/00827, filed on Dec. 7, 1995.–;

Title page, item [30], please add the following Foreign Application Priority Data:

–May 29, 1992 (AU) PL2677
Jun. 30, 1992 (AU) ....PL3216–.

Signed and Sealed this

Twenty-fourth Day of April, 2007

Jon W. Dudas

JON W. DUDAS
Director of the United States Patent and Trademark Office

No. 13-298

IN THE

Supreme Court of the United States

JAN 21 2014

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

JOINT APPENDIX: VOLUME III OF III

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Exhibit 6: Amendment and Reply Under 37 C.F.R. § 1.111, dated October 31, 2003, from the prosecution history for U.S. Patent No. 6,912,510 1278

Exhibit 7: Terminal Disclaimer To Obviate A Double Patenting Rejection Over A Prior Patent, dated October 31, 2003, from the prosecution history for U.S. Patent No. 6,912,510 1301

Exhibit 8: Office Action, dated December 28, 2005, from the prosecution history for U.S. Patent No. 7,149,720 1302

Exhibit 9: Terminal Disclaimer To Obviate A Double Patenting Rejection Over A "Prior" Patent, dated January 27, 2006, from the prosecution history for U.S. Patent No. 7,149,720 1308

Exhibit 10: Terminal Disclaimer To Obviate A Double Patenting Rejection Over A "Prior" Patent, dated September 11, 2008, from the prosecution history for U.S. Patent No. 7,725,375 1309

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Exhibit 3: Claims, dated March 29, 2010, from the prosecution history for U.S. Patent App. No. 11/642,437 1413

Exhibit 4: *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101*, dated August 24, 2009 1442

Exhibit 5: *Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of Bilski v. Kappos*, published in Federal Register, volume 75, number 143, page 43,922, dated July 27, 2010 1462

Exhibit 6: Transcript of Status Conference before Judge Collyer, dated August 6, 2010 1489

Exhibit 7: Notice of Allowance and Fees Due, dated October 5, 2004 1504

Exhibit 8: U.S. Patent and Trademark Office *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101* Training Materials, dated August 215, 2009 .. 1516

NOTICE

The following documents have been omitted from the printing of this Joint Appendix. They may be found in the Petitioner's Appendix to the 13-298 Petition For A Writ Of Certiorari at the following pages:

CLS Bank Int'l v. *Alice Corp.*, 717 F.3d 1269 (Fed. Cir. 2013)	1a
CLS Bank Int'l v. *Alice Corp.*, 685 F.3d 1341 (Fed. Cir. 2012)	132a
CLS Bank Int'l v. *Alice Corp.*, 768 F. Supp. 2d 221 (D.D.C. 2011)	172a
CLS Bank Int'l v. *Alice Corp.*, 484 F. App'x 559 (Fed. Cir. 2012)	239a

EXHIBIT 4

(12) United States Patent

Shepherd

(10) Patent No.: US 7,725,375 B2

(45) Date of Patent: *May 25, 2010

---

(54) SYSTEMS AND COMPUTER PROGRAM PRODUCTS FOR EXCHANGING AN OBLIGATION

(75)	Inventor:	Ian Kenneth Shepherd, Victoria (AU)
(73)	Assignee:	Alice Corporation Pty Ltd (AU)
(*)	Notice:	Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 738 days. This patent is subject to a terminal disclaimer.
(21)	Appl. No.:	11/166,387
(22)	Filed:	Jun. 27, 2005

(65) Prior Publication Data

US 2005/0246197 Al Nov. 3, 2005

Related U.S. Application Data

(63) Continuation of application No. 09/567,507, filed on May 9, 2000, now Pat. No. 6,912,510, which is a continuation of application No. 08/870,691, filed on Jun. 6, 1997, now Pat. No. 6,134,536, which is a continuation-in-part of application No. 08/070,136, filed on May 28, 1993, now Pat. No. 5,970,479, which is a

continuation-in-part of application No. PCT/AU95/ 00827, filed on Dec. 7, 1995.

(30) Foreign Application Priority Data

May 29, 1992	(AU)	....	PL2677
Jun. 30, 1992	(AU)	....	PL3216
Dec. 7, 1994	(AU)	....	PM9922
Jul. 7, 1995	(AU)	....	PN4060

(51) Int.Cl.
G06Q 40/00 (2006.01)

(52) U.S. CL. 705/35

(58) Field of Classification Search 705/37, 705/35

See application file for complete search history.

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(Continued)

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EP 0 276 816 A2 811988

(Continued)

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970

(57) ABSTRACT

Methods and apparatus which deal with the management of risk relating to specified, yet unknown, future events are disclosed.

'Sponsor' stakeholders specify a particular product relating to an event or phenomenon for which there is a range of possible future outcomes.

'Ordering' stakeholders then offer contracts relating to the predetermined phenomenon and corresponding range of outcomes. The offered contracts specify an entitlement or (pay-oil) at the future time of maturity for each outcome, and a consideration (or premium) payable, in exchange, to a 'counter-party' stakeholder.

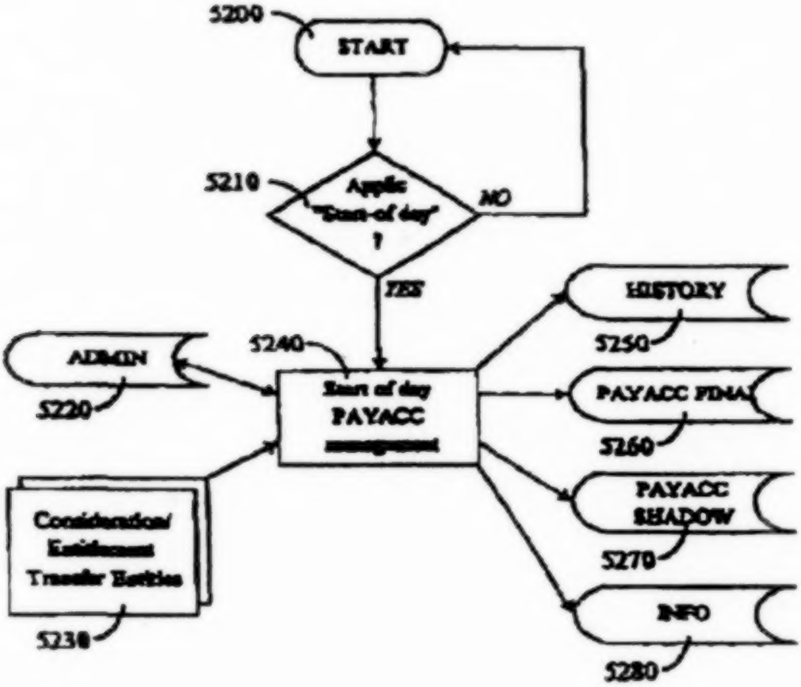
Independently of the offered contracts, the 'counter-party' stakeholders input data as to their view of the likelihood of occurrence of each outcome in the predetermined range into the future, or specifically at the predetermined date of maturity.

Each offered contract is priced by the processing units by calculating counter-party premiums from the registered data, and a match attempted by a comparison of the offered premium with the calculated premiums.

Matched contracts can be further traded until maturity, and at-maturity processing handles the exchange of entitlement as between the matched parties to the contract.

971

47 Claims, 117 Drawing Sheets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START
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* cited by examiner

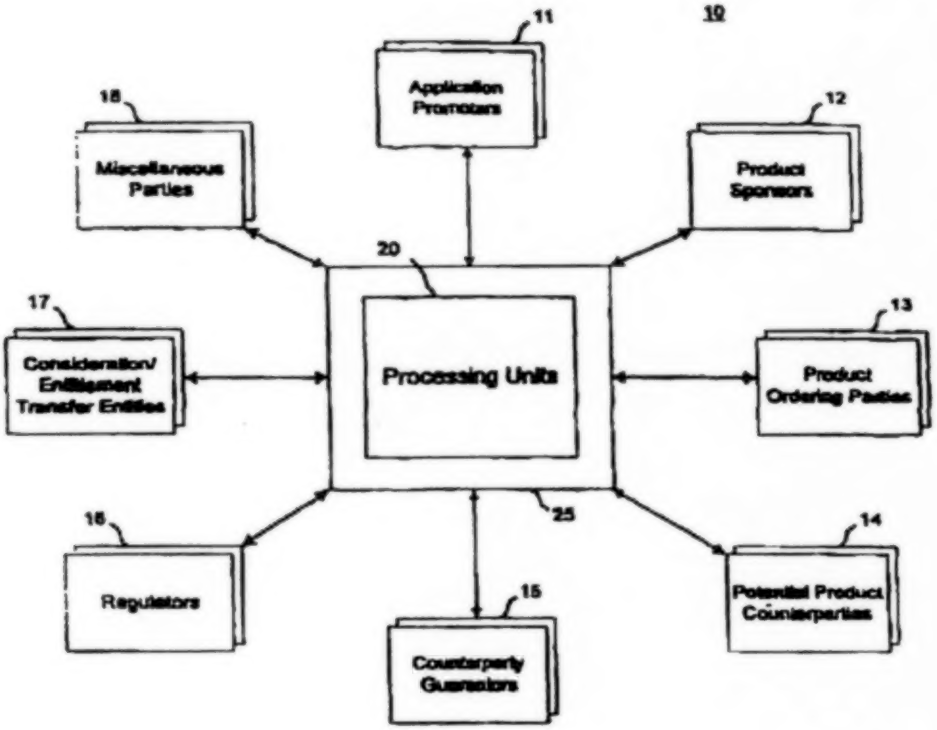

10
11
Application Promoters
12
Product Sponsors
13
Product Ordering Parties
14
Potential Product Counterparties
15
Counterparty Guarantors
16
Regulators
17
Consideration/ Entitlement Transfer Entities
18
Miscellaneous Parties
20
Processing Units
25

FIG. 1

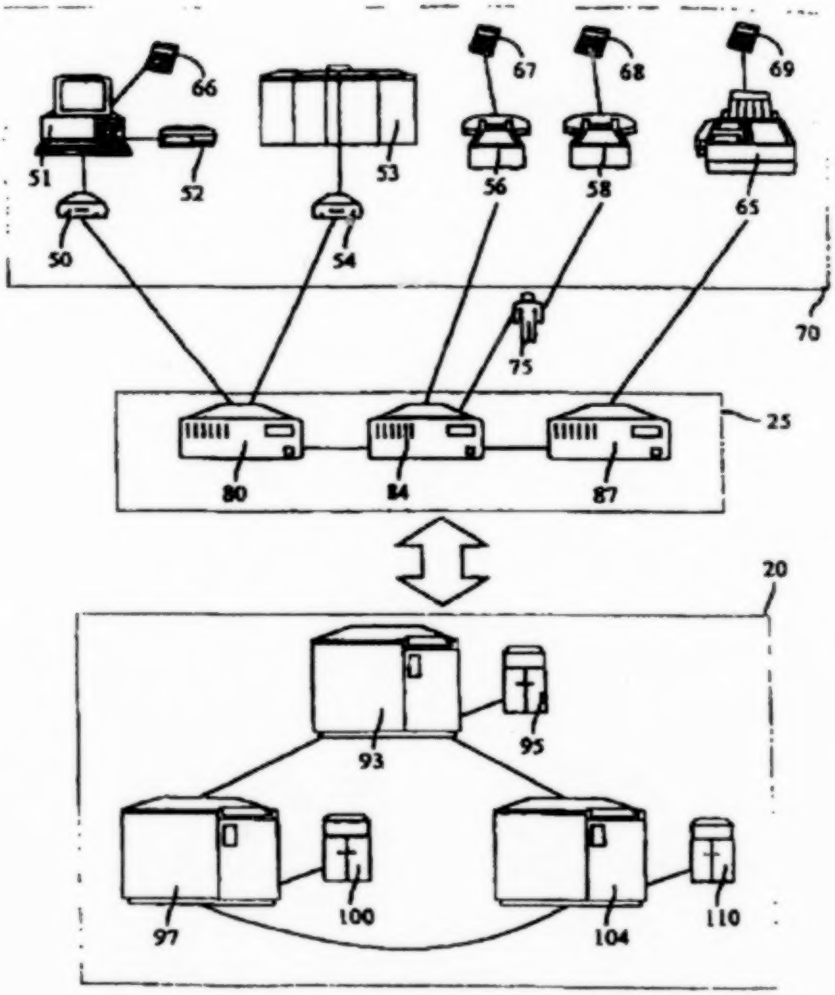
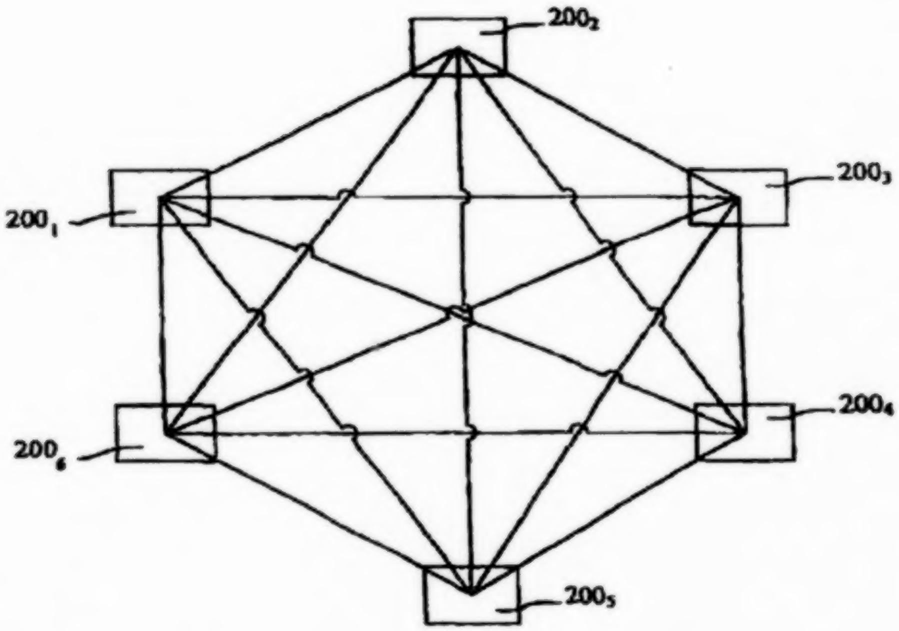


Fig. 2a



200_2
200_3
200_1
200_4
200_6
200_5

Fig. 2b

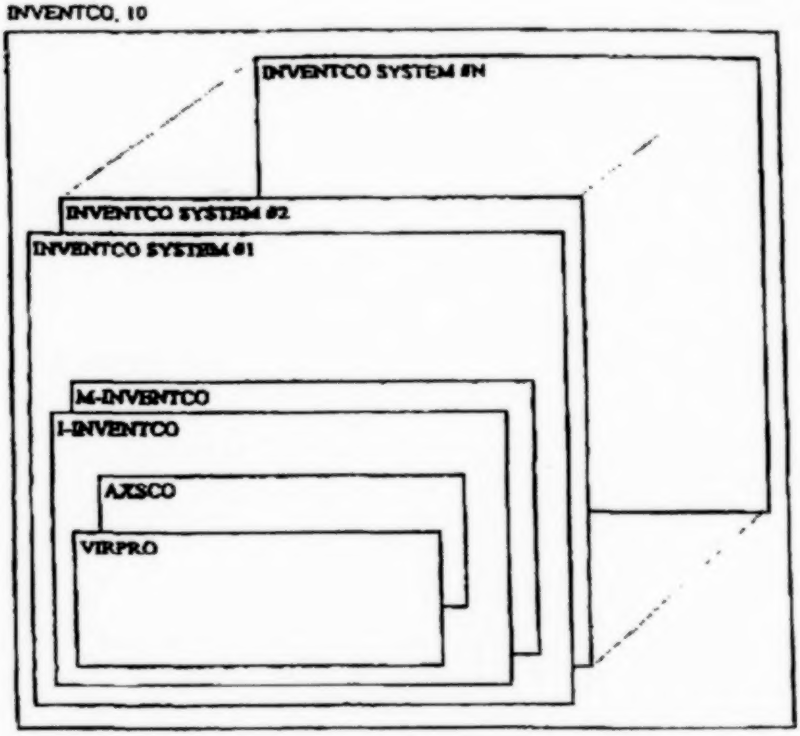

INVENTCO, 10
INVENTCO SYSTEM #N
INVENTCO SYSTEM #2
INVENTCO SYSTEM #1
M-INVENTCO
I-INVENTCO
AXSCO
VIRPRO

Fig. 3

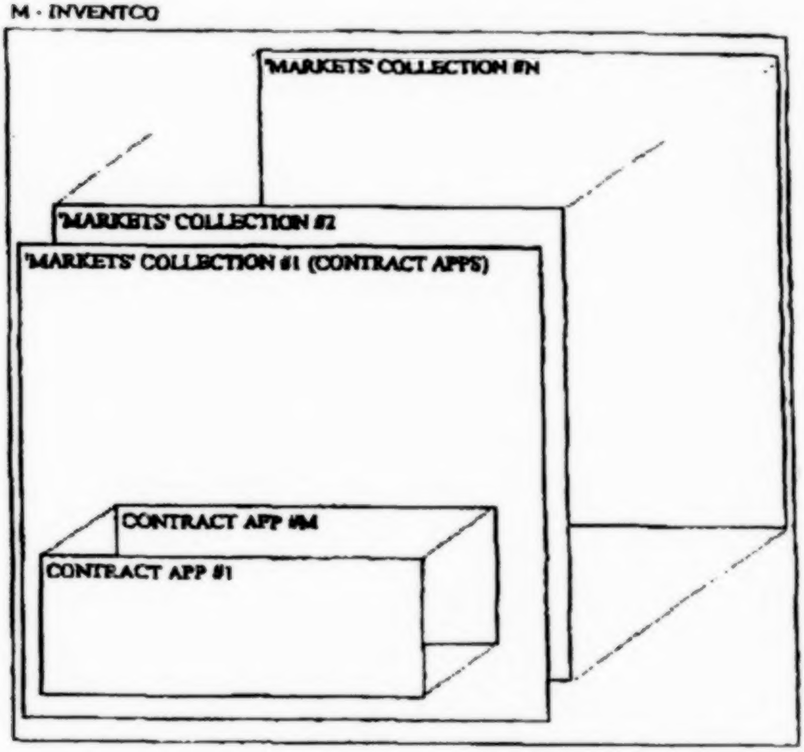

M - INVENTCO
'MARKETS' COLLECTION #N
'MARKETS' COLLECTION #2
'MARKETS' COLLECTION #1 (CONTRACT APPS)
CONTRACT APP #M
CONTRACT APP #1

Fig. 4

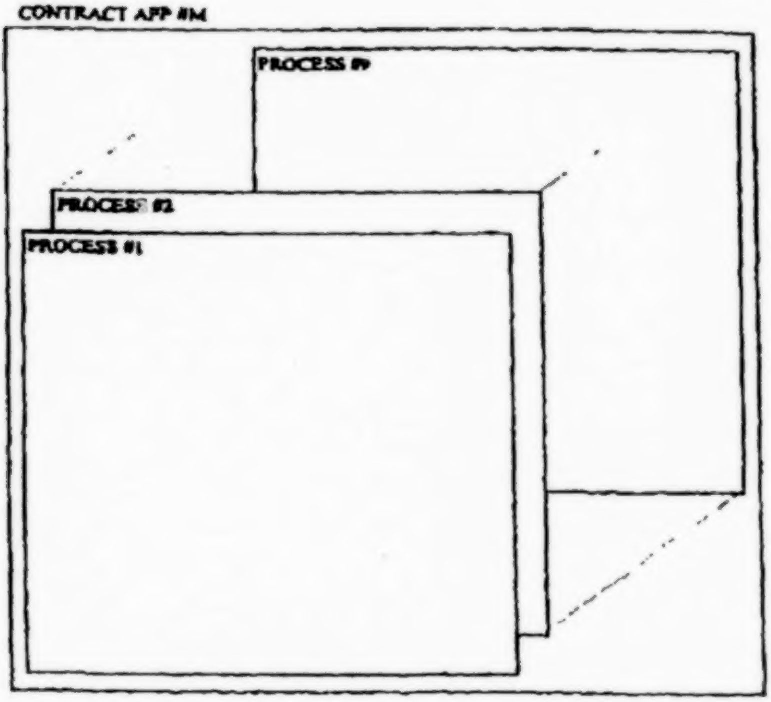
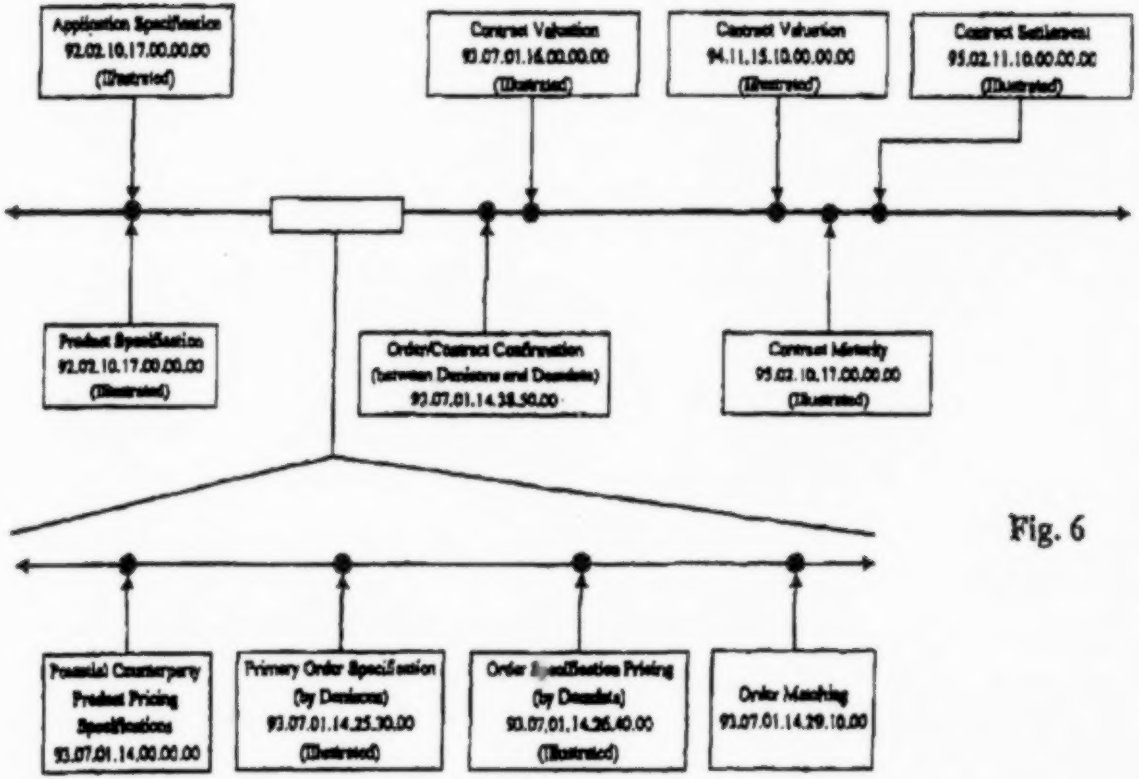

CONTRACT APP #M
PROCESS #P
PROCESS #2
PROCESS #1

Fig. 5

EXAMPLE I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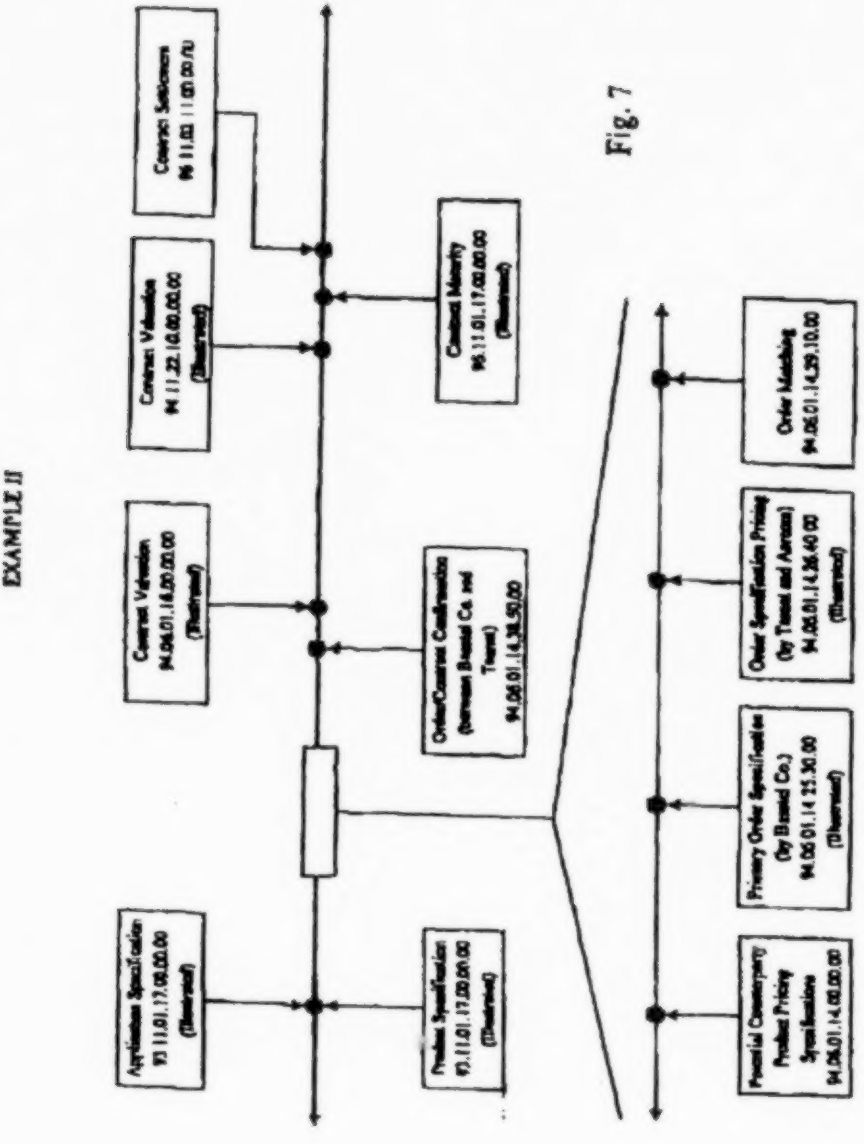
(Illustrated)
Contract Valuation
93.07.01.16.00.00.00
(Illustrated)
Contract Valuation
94.11.15.10.00.00.00
(Illustrated)
Contract Settlement
95.02.11.10.00.00.00
(Illustrated)
Product Specification
92.02.10.17.00.00.00
(Illustrated)
Order/Contract Confirmation
(between Demisors and Demandants)
93.07.01.14.38.50.00
Contract Maturity
95.02.10.17.00.00.00
(Illustrated)
Potential Counterparty
Product Pricing
Specifications
93.07.01.14.00.00.00
Primary Order Specification
(by Demisors)
93.07.01.14.25.30.00
(Illustrated)
Order Specification Pricing
(by Demandants)
93.07.01.14.26.40.00
(Illustrated)
Order Matching
93.07.01.14.29.10.00

Fig. 6


EXAMPLE II
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Product Specification 93.11.01.17.00.00.00 (Illustrated)
Contract Valuation 94.04.01.14.00.00.00 (Illustrated)
Order/Contract Confirmation (between Brand Co. and Trader) 94.05.01.14.38.50.00
Contract Valuation 94.11.22.10.00.00.00 (Illustrated)
Contract Maturity 95.11.01.17.00.00.00 (Illustrated)
Contract Settlement 95.11.02.11.00.00.00
Potential Counterparty Product Pricing Specifications 94.05.01.14.00.00.00
Primary Order Specification (by Brand Co.) 94.05.01.14.25.30.00 (Illustrated)
Order Specification Pricing (by Trader and Acceptor) 94.05.01.14.28.40.00 (Illustrated)
Order Matching 94.05.01.14.29.10.00

Fig. 7

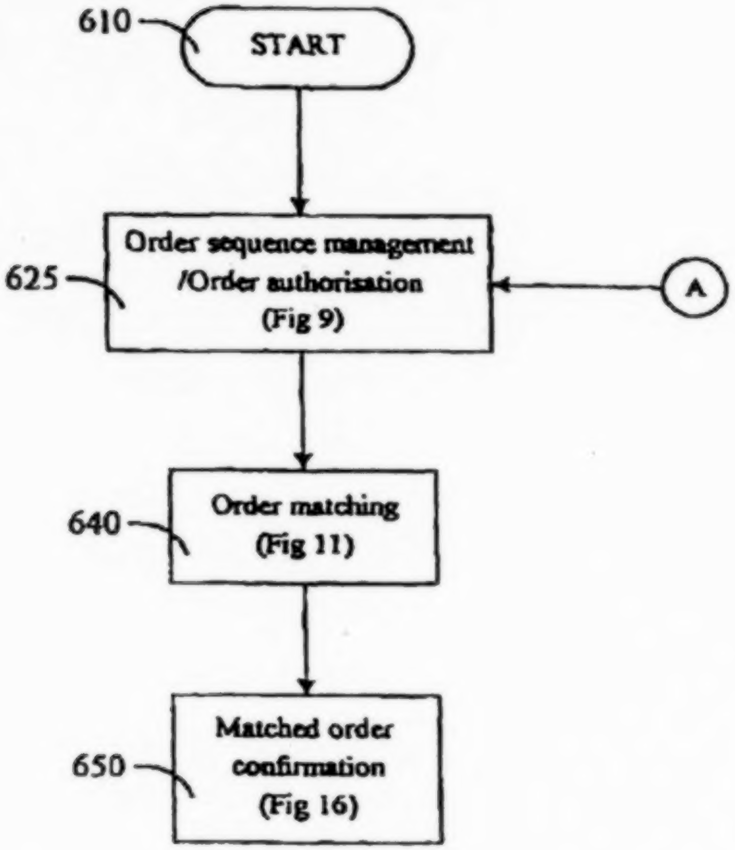

610
START
625
Order sequence management
/Order authorisation
(Fig 9)
A
640
Order matching
(Fig 11)
650
Matched order
confirmation
(Fig 16)

Fig. 8

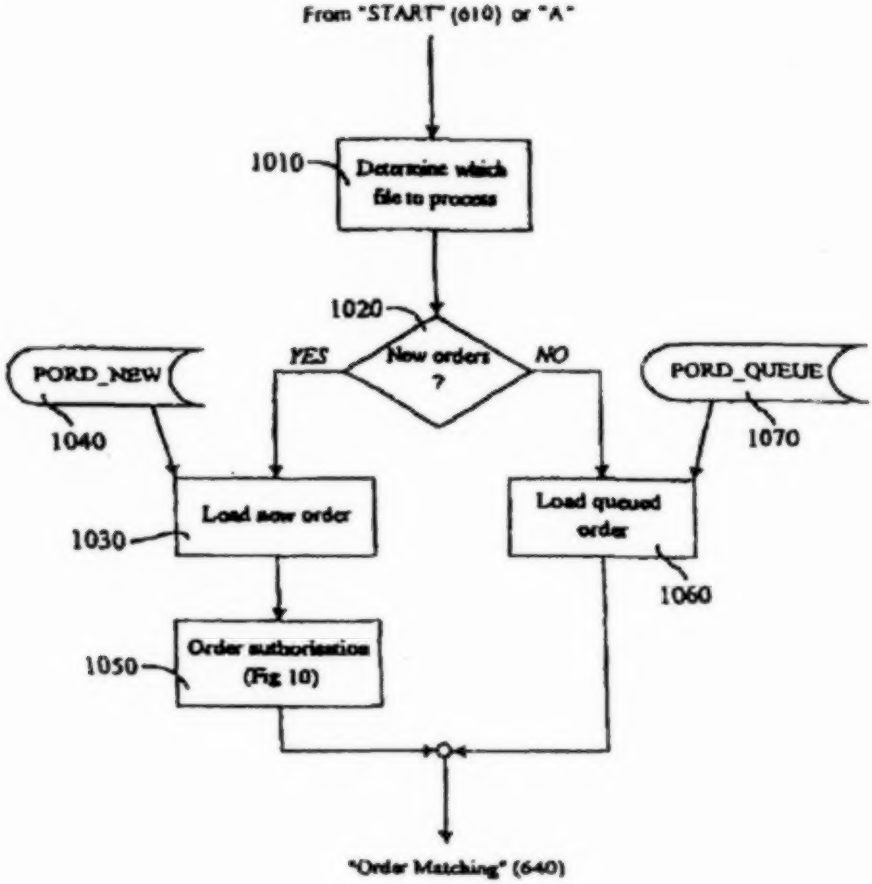

From "START" (610) or "A"
1010
Determine which file to process
1020
New orders ?
YES
NO
PORD_NEW
1040
PORD_QUEUE
1070
Load new order
1030
Load queued order
1060
Order authorisation (Fig 10)
1050
"Order Matching" (640)

Fig. 9

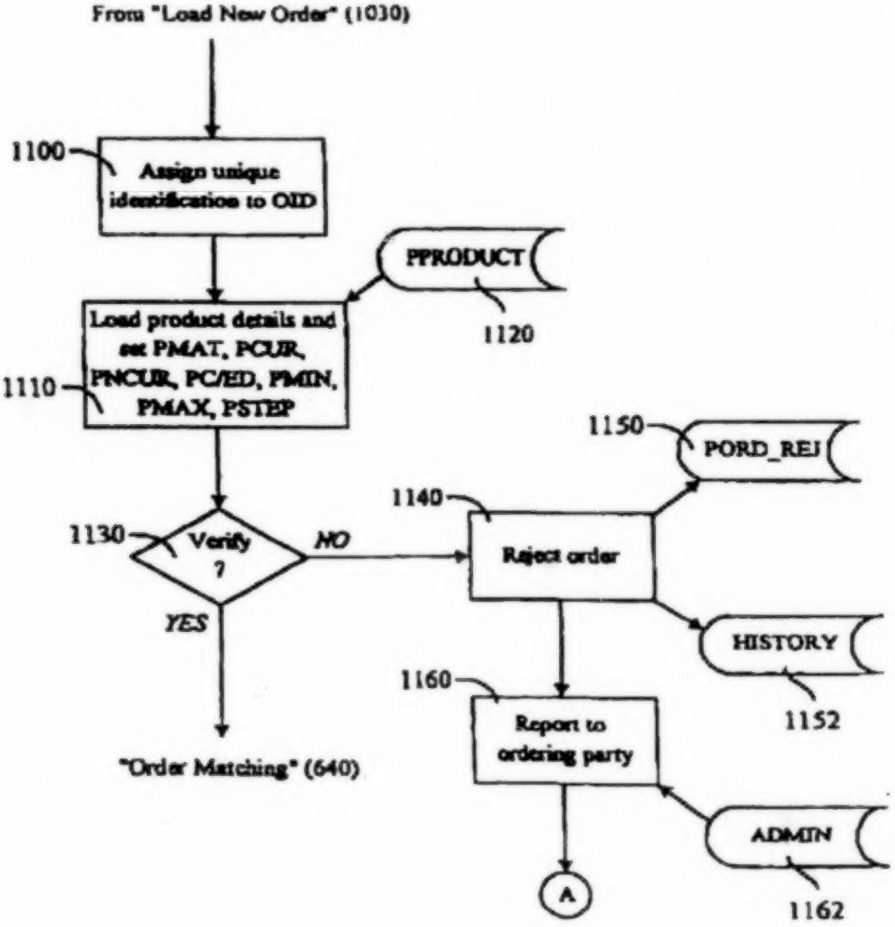

From "Load New Order" (1030)
1100
Assign unique identification to OID
PPRODUCT
1120
Load product details and set PMAT, PCUR, PNCUR, PC/ED, PMIN, PMAX, PSTEP
1110
1150
PORD_REJ
1140
1130
Verify ?
NO
Reject order
YES
HISTORY
1160
1152
Report to ordering party
"Order Matching" (640)
ADMIN
A
1162

Fig. 10

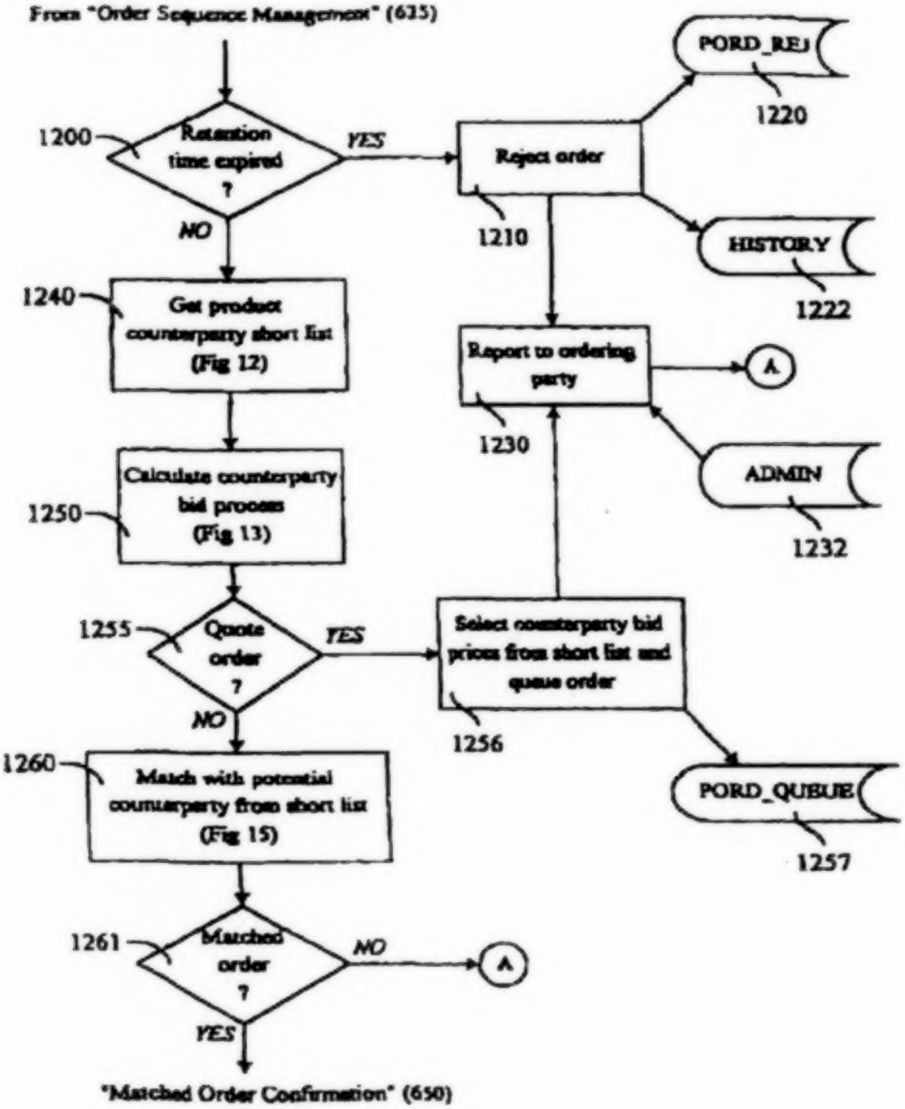

From "Order Sequence Management" (635)
1200
Retention time expired ?
YES
NO
Reject order
1210
PORD_REJ
1220
HISTORY
1222
1240
Get product counterparty short list (Fig 12)
Report to ordering party
1230
A
ADMIN
1232
1250
Calculate counterparty bid process (Fig 13)
1255
Quote order ?
YES
NO
Select counterparty bid prices from short list and queue order
1256
PORD_QUEUE
1257
1260
Match with potential counterparty from short list (Fig 15)
1261
Matched order ?
NO
A
YES
"Matched Order Confirmation" (650)

Fig. 11

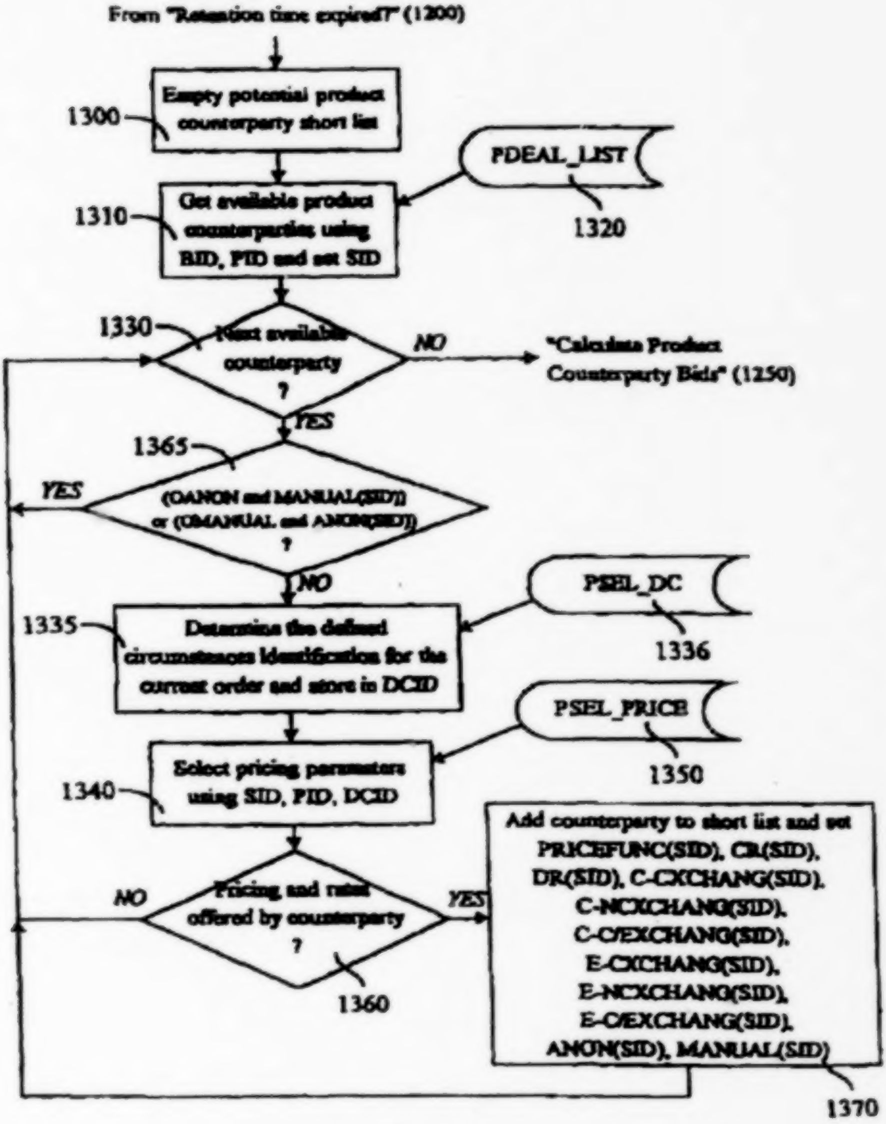

From "Retention time expired?" (1200)
1300
Empty potential product counterparty short list
1310
Get available product counterparties using BID, PID and set SID
PDEAL_LIST
1320
1330
Next available counterparty ?
NO
"Calculate Product Counterparty Bids" (1250)
YES
1365
YES
(OANON and MANUAL(SID)) or (OMANUAL and ANON(SID)) ?
NO
PSEL_DC
1336
1335
Determine the defined circumstances identification for the current order and store in DCID
PSEL_PRICE
1350
1340
Select pricing parameters using SID, PID, DCID
NO
Pricing and rates offered by counterparty ?
YES
1360
Add counterparty to short list and set PRICEFUNC(SID), CR(SID), DR(SID), C-CXCHANG(SID), C-NCXCHANG(SID), C-C/EXCHANG(SID), E-CXCHANG(SID), E-NCXCHANG(SID), E-C/EXCHANG(SID), ANON(SID), MANUAL(SID)
1370

Fig. 12

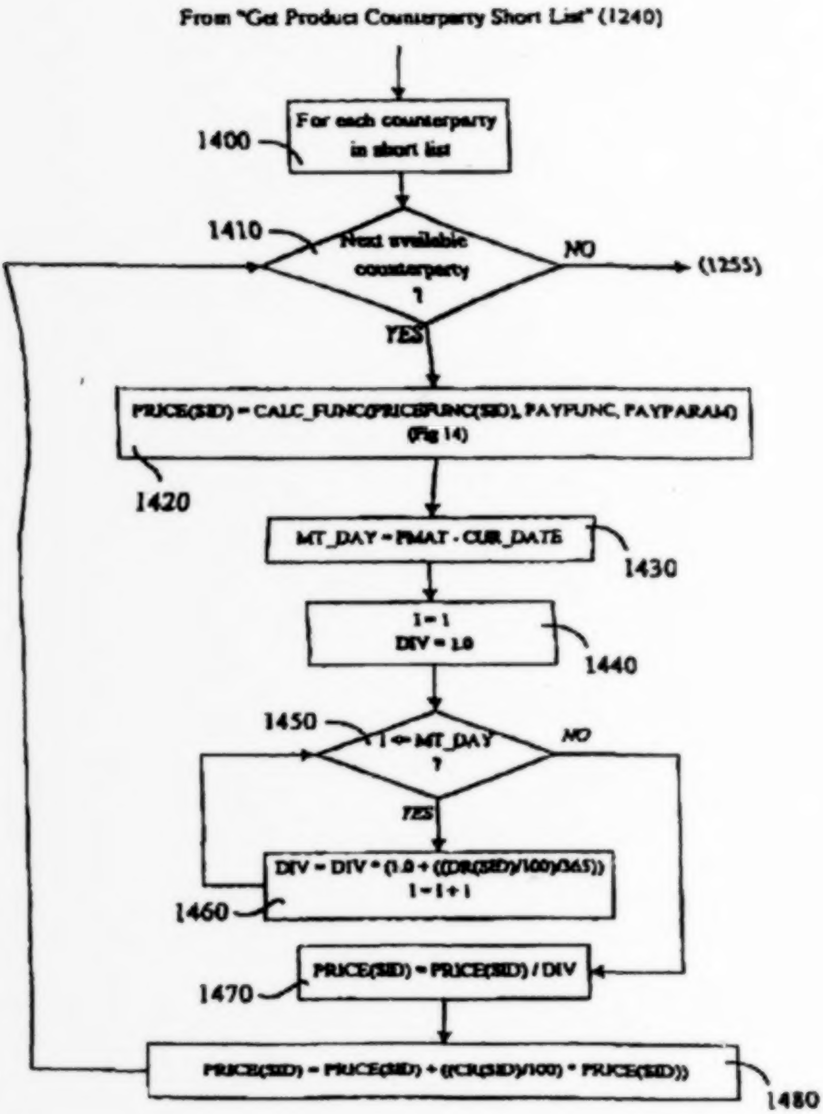

From "Get Product Counterparty Short List" (1240)
1400
For each counterparty in short list
1410
Next available counterparty ?
NO
(1255)
YES
PRICE(SID) = CALC_FUNC(PRICEFUNC(SID), PAYFUNC, PAYPARAM)
(Fig 14)
1420
MT_DAY = PMAT - CUR_DATE
1430
I = 1
DIV = 1.0
1440
1450
I <= MT_DAY ?
NO
YES
DIV = DIV * (1.0 + ((DR(SID)/100)/365))
I = I + 1
1460
PRICE(SID) = PRICE(SID) / DIV
1470
PRICE(SID) = PRICE(SID) + ((CR(SID)/100) * PRICE(SID))
1480

Fig. 13

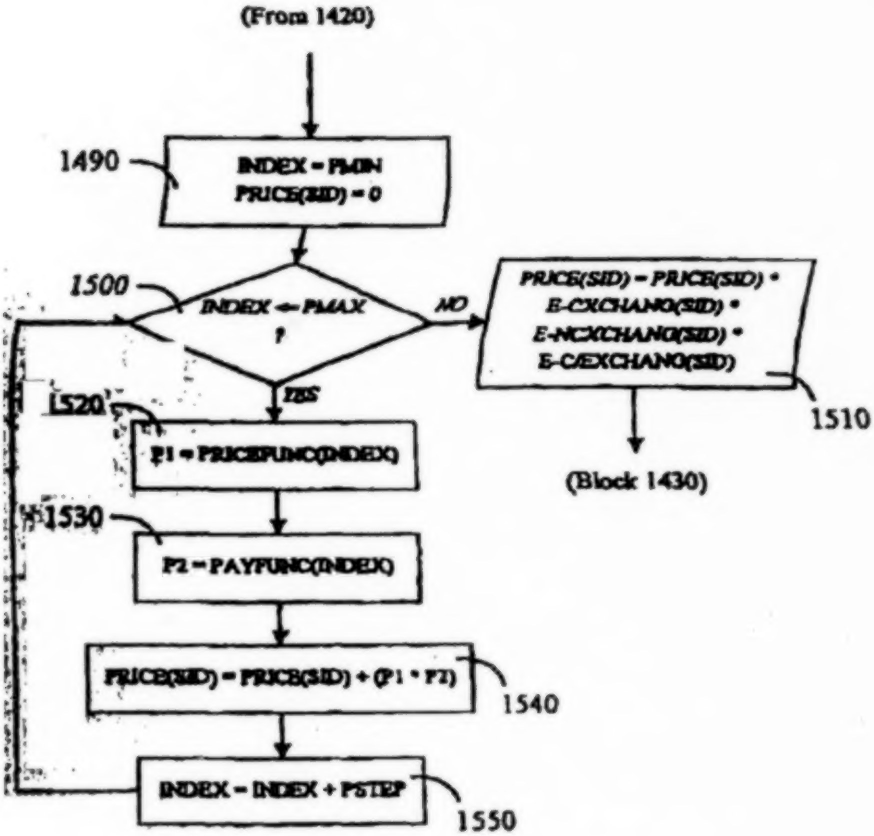

(From 1420)
1490
INDEX = PMIN
PRICE(SID) = 0
1500
INDEX <= PMAX ?
NO
PRICE(SID) = PRICE(SID) *
E-CXCHANG(SID) *
E-NCXCHANG(SID) *
E-C/EXCHANG(SID)
1510
(Block 1430)
YES
1520
P1 = PRICEFUNC(INDEX)
1530
P2 = PAYFUNC(INDEX)
PRICE(SID) = PRICE(SID) + (P1 * P2)
1540
INDEX = INDEX + PSTEP
1550

Fig. 14

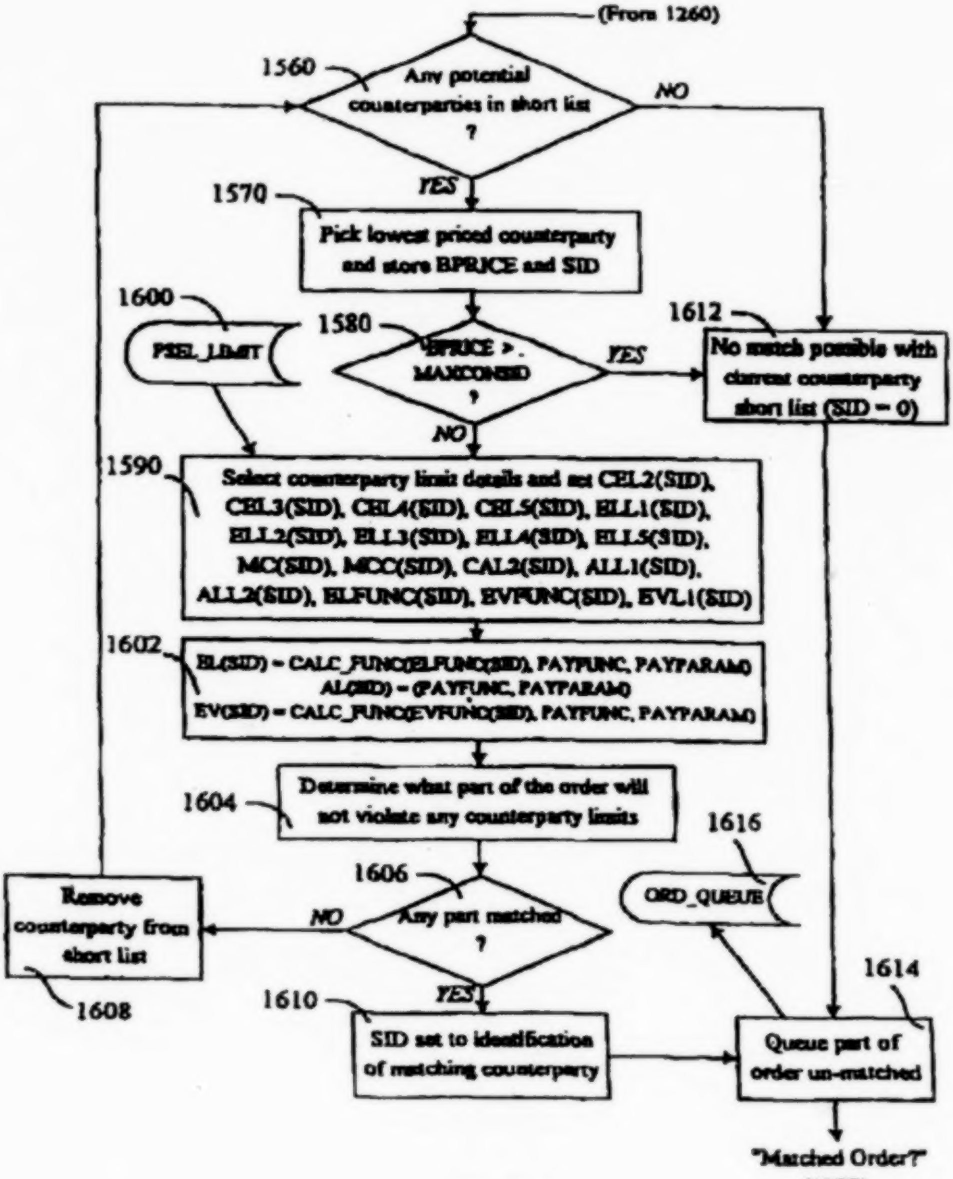

(From 1260)
1560
Any potential counterparties in short list ?
NO
YES
1570
Pick lowest priced counterparty and store BPRICE and SID
1600
PSEL_LIMIT
1580
BPRICE > MAXCONSID ?
YES
1612
No match possible with current counterparty short list (SID = 0)
NO
1590
Select counterparty limit details and set CEL2(SID), CEL3(SID), CEL4(SID), CEL5(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), MC(SID), MCC(SID), CAL2(SID), ALL1(SID), ALL2(SID), ELFUNC(SID), EVFUNC(SID), EVL1(SID)
1602
EL(SID) = CALC_FUNC(ELFUNC(SID), PAYFUNC, PAYPARAM)
AL(SID) = (PAYFUNC, PAYPARAM)
EV(SID) = CALC_FUNC(EVFUNC(SID), PAYFUNC, PAYPARAM)
1604
Determine what part of the order will not violate any counterparty limits
1616
ORD_QUEUE
1606
Any part matched ?
NO
Remove counterparty from short list
1608
YES
1610
SID set to identification of matching counterparty
1614
Queue part of order un-matched
"Matched Order?"
(1228)

Fig. 15

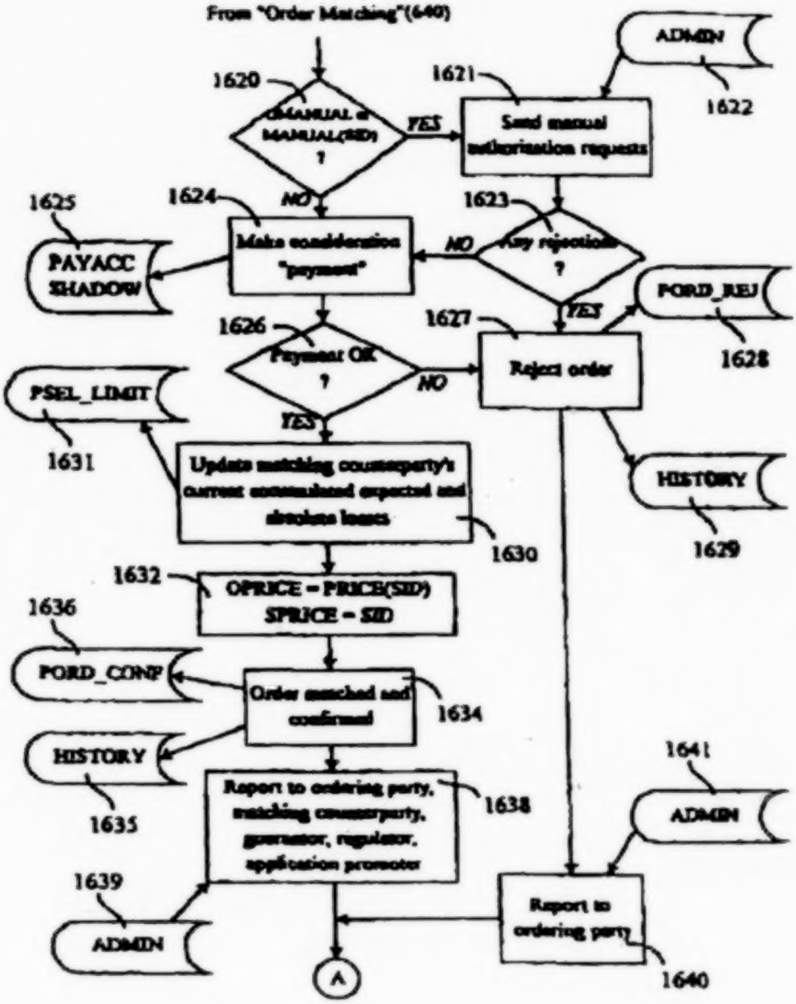
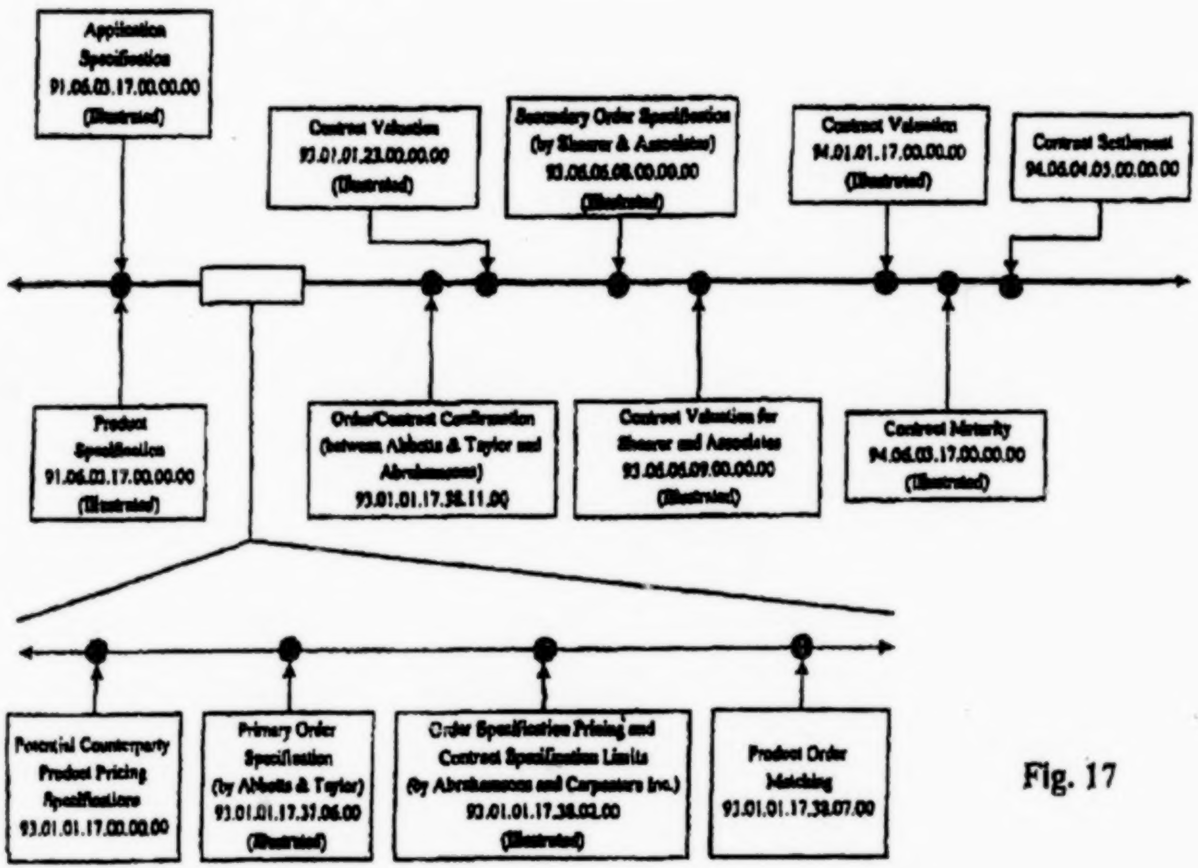

From "Order Matching"(640)
1620
OMANUAL or MANUAL(SID) ?
YES
1621
Send manual authorization requests
ADMIN
1622
NO
1624
1625
Make consideration "payment"
PAYACC SHADOW
1623
Any rejections ?
NO
YES
PORD_REJ
1628
1627
Reject order
1626
Payment OK ?
NO
YES
PSEL_LIMIT
1631
Update matching counterparty's current accumulated expected and absolute losses
1630
HISTORY
1629
1632
OPRICE = PRICE(SID)
SPRICE = SID
1636
PORD_CONF
Order matched and confirmed
1634
HISTORY
1635
Report to ordering party, matching counterparty, guarantor, regulator, application promoter
1638
1641
ADMIN
1639
ADMIN
Report to ordering party
1640
A

Fig. 16

EXAMPLE III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Contract Valuation 93.01.01.23.00.00.00 (Illustrated)
Secondary Order Specification (by Shearer & Associates) 93.06.05.08.00.00.00 (Illustrated)
Contract Valuation 94.01.01.17.00.00.00 (Illustrated)
Contract Settlement 94.06.04.05.00.00.00
Product Specification 91.06.03.17.00.00.00 (Illustrated)
Order/Contract Confirmation (between Abbotts & Taylor and Abrahamsons) 93.01.01.17.38.11.00
Contract Valuation for Shearer and Associates 93.06.06.09.00.00.00 (Illustrated)
Contract Maturity 94.06.03.17.00.00.00 (Illustrated)
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Primary Order Specification (by Abbotts & Taylor) 93.01.01.17.37.06.00 (Illustrated)
Order Specification Pricing and Contract Specification Limits (by Abrahamsons and Carpenters Inc.) 93.01.01.17.38.02.00 (Illustrated)
Product Order Matching 93.01.01.17.38.07.00

Fig. 17

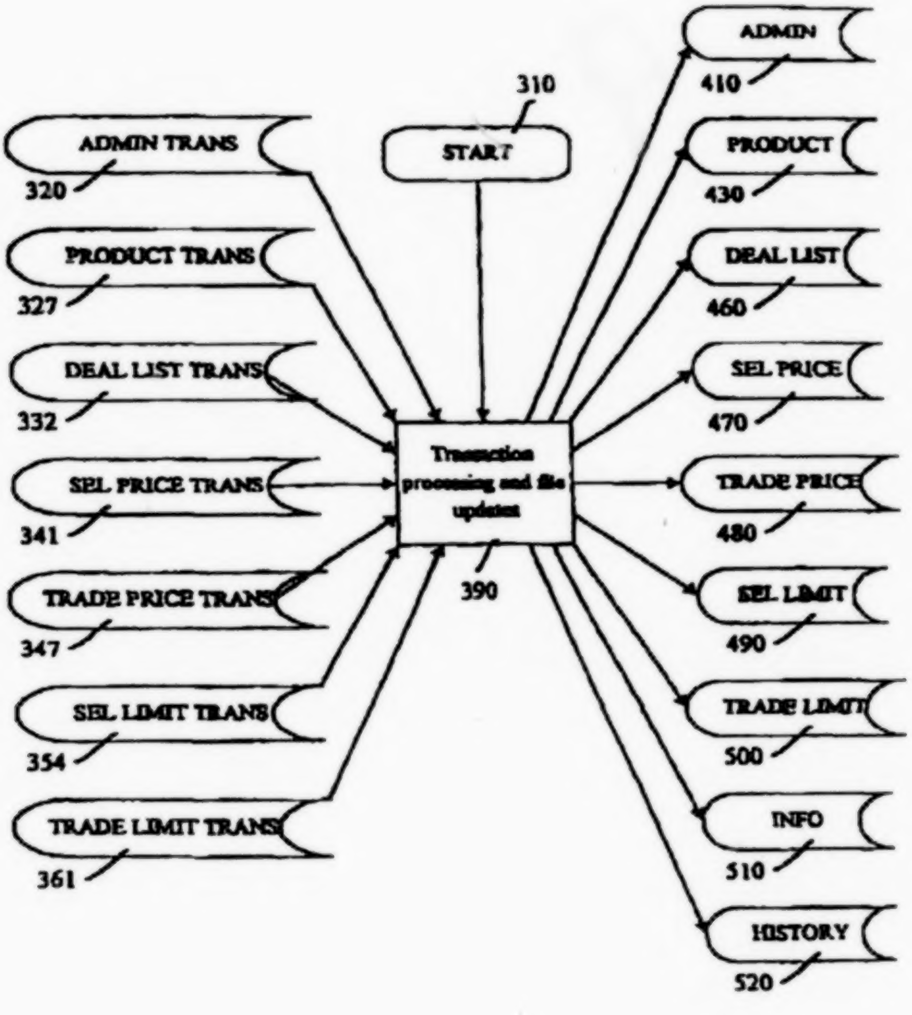

310
START
ADMIN TRANS
320
PRODUCT TRANS
327
DEAL LIST TRANS
332
SEL PRICE TRANS
341
TRADE PRICE TRANS
347
SEL LIMIT TRANS
354
TRADE LIMIT TRANS
361
Transaction processing and file updates
390
ADMIN
410
PRODUCT
430
DEAL LIST
460
SEL PRICE
470
TRADE PRICE
480
SEL LIMIT
490
TRADE LIMIT
500
INFO
510
HISTORY
520

Fig. 18

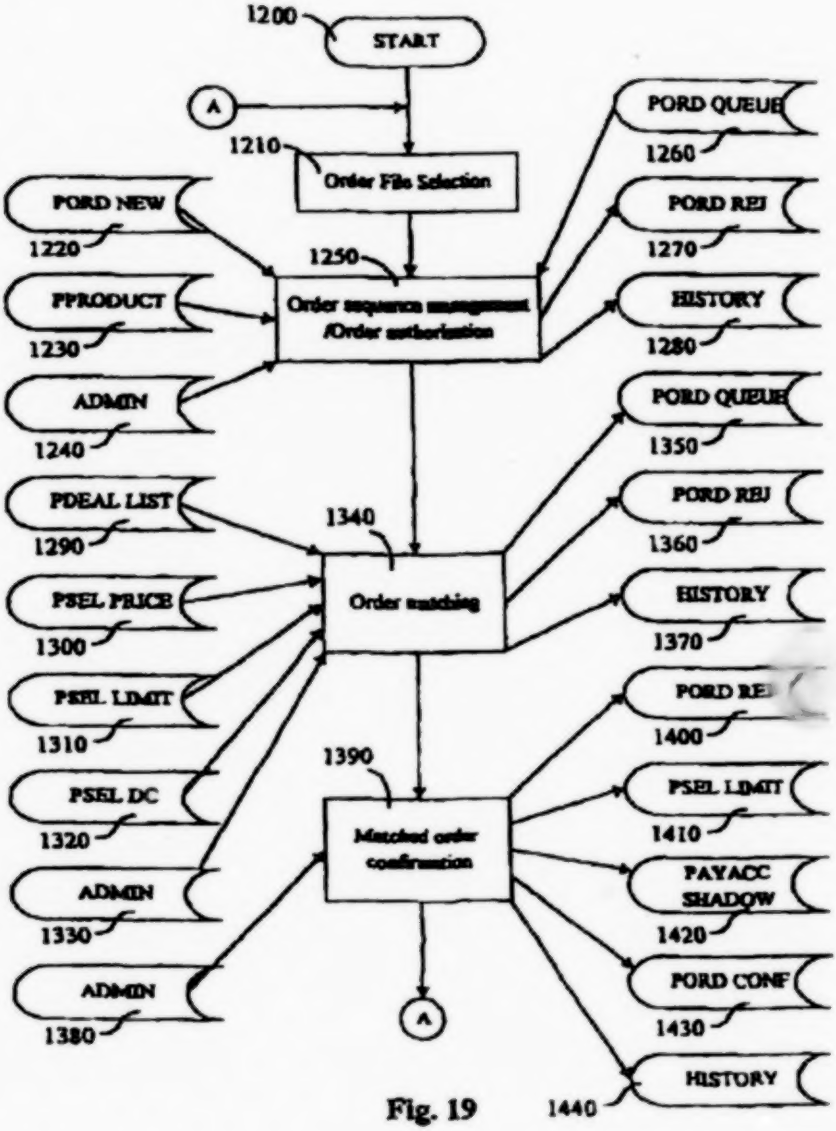

1200
START
A
1210
Order File Selection
PORD NEW
1220
PPRODUCT
1230
ADMIN
1240
1250
Order sequence management /Order authorization
PORD QUEUE
1260
PORD REJ
1270
HISTORY
1280
PDEAL LIST
1290
PSEL PRICE
1300
PSEL LIMIT
1310
PSEL DC
1320
ADMIN
1330
ADMIN
1380
1340
Order matching
PORD QUEUE
1350
PORD REJ
1360
HISTORY
1370
1390
Matched order confirmation
PORD REJ
1400
PSEL LIMIT
1410
PAYACC SHADOW
1420
PORD CONF
1430
HISTORY
1440
A

Fig. 19

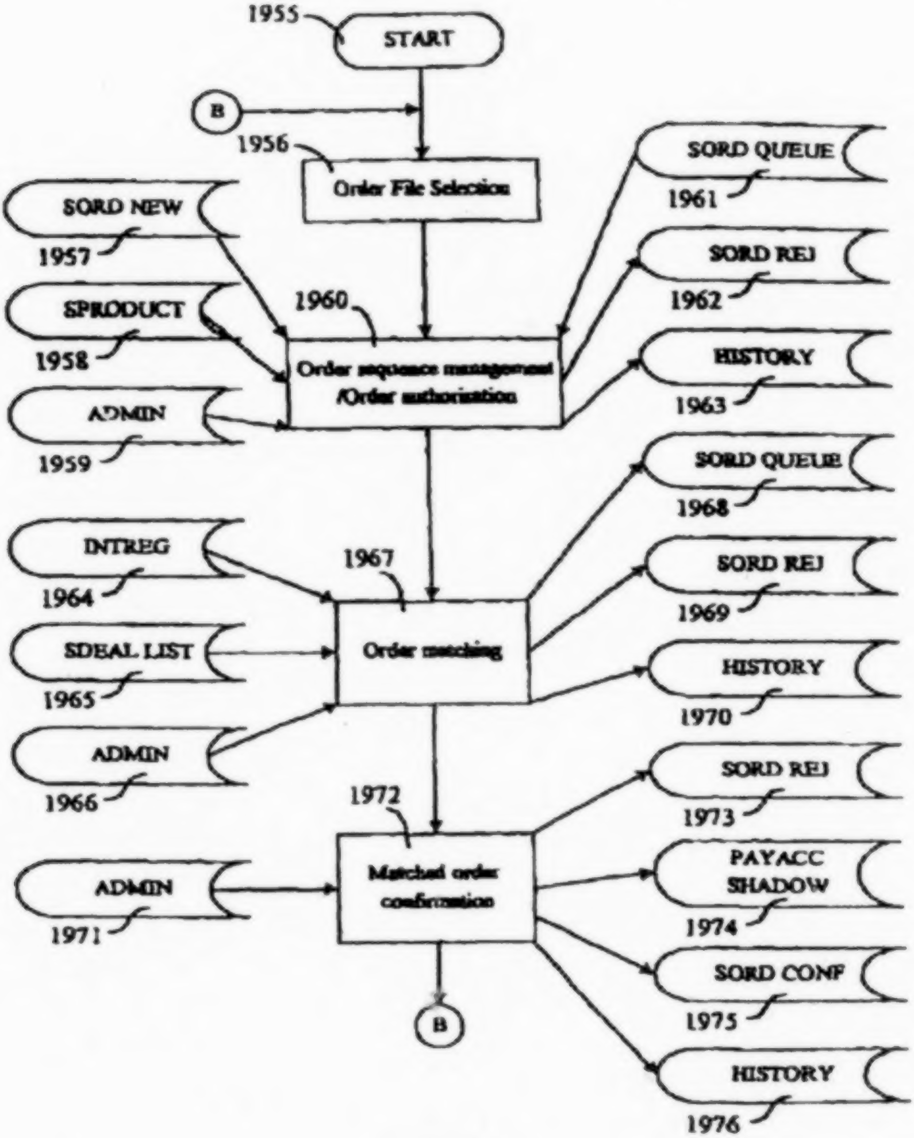

1955
START
B
1956
Order File Selection
SORD NEW
1957
SPRODUCT
1958
ADMIN
1959
1960
Order sequence management /Order authorisation
SORD QUEUE
1961
SORD REJ
1962
HISTORY
1963
INTREG
1964
SDEAL LIST
1965
ADMIN
1966
1967
Order matching
SORD QUEUE
1968
SORD REJ
1969
HISTORY
1970
ADMIN
1971
1972
Matched order confirmation
SORD REJ
1973
PAYACC SHADOW
1974
SORD CONF
1975
HISTORY
1976
B

Fig. 20

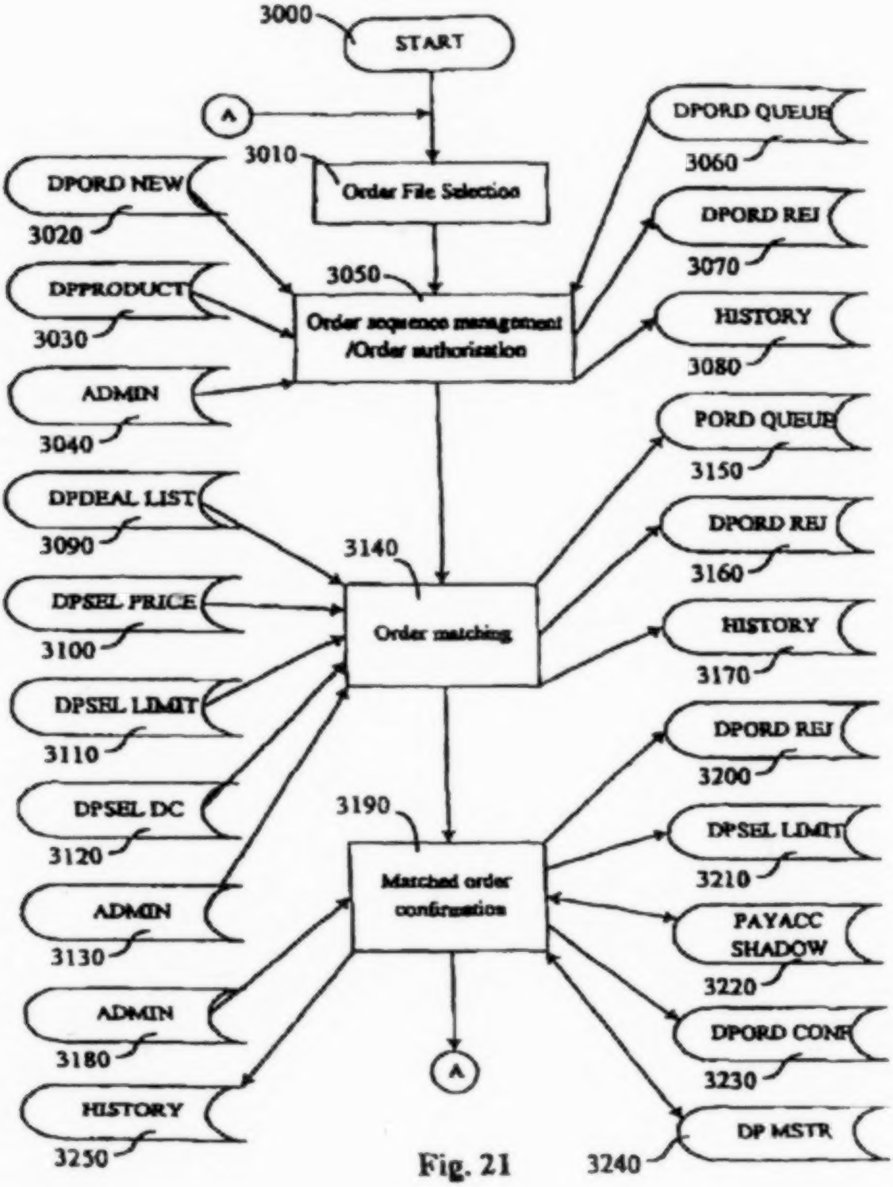

3000
START
A
3010
Order File Selection
DPORD NEW
3020
DPPRODUCT
3030
ADMIN
3040
3050
Order sequence management /Order authorisation
DPORD QUEUE
3060
DPORD REJ
3070
HISTORY
3080
DPDEAL LIST
3090
DPSEL PRICE
3100
DPSEL LIMIT
3110
DPSEL DC
3120
ADMIN
3130
3140
Order matching
PORD QUEUE
3150
DPORD REJ
3160
HISTORY
3170
3190
Matched order confirmation
ADMIN
3180
HISTORY
3250
A
DPORD REJ
3200
DPSEL LIMIT
3210
PAYACC SHADOW
3220
DPORD CONF
3230
DP MSTR
3240

Fig. 21

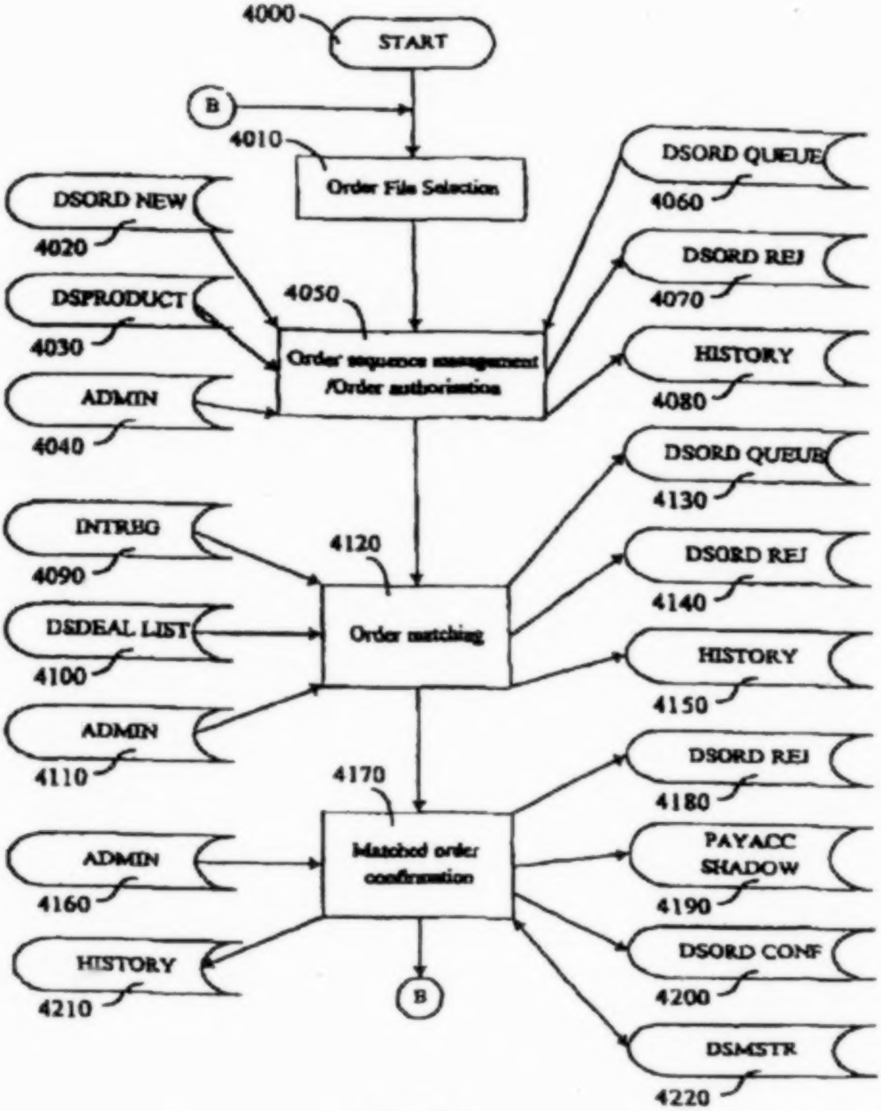

4000
START
B
4010
Order File Selection
DSORD NEW
4020
DSPRODUCT
4030
ADMIN
4040
4050
Order sequence management /Order authorisation
DSORD QUEUE
4060
DSORD REJ
4070
HISTORY
4080
INTREG
4090
DSDEAL LIST
4100
ADMIN
4110
4120
Order matching
DSORD QUEUE
4130
DSORD REJ
4140
HISTORY
4150
4170
Matched order confirmation
ADMIN
4160
HISTORY
4210
B
DSORD REJ
4180
PAYACC SHADOW
4190
DSORD CONF
4200
DSMSTR
4220

Fig. 22

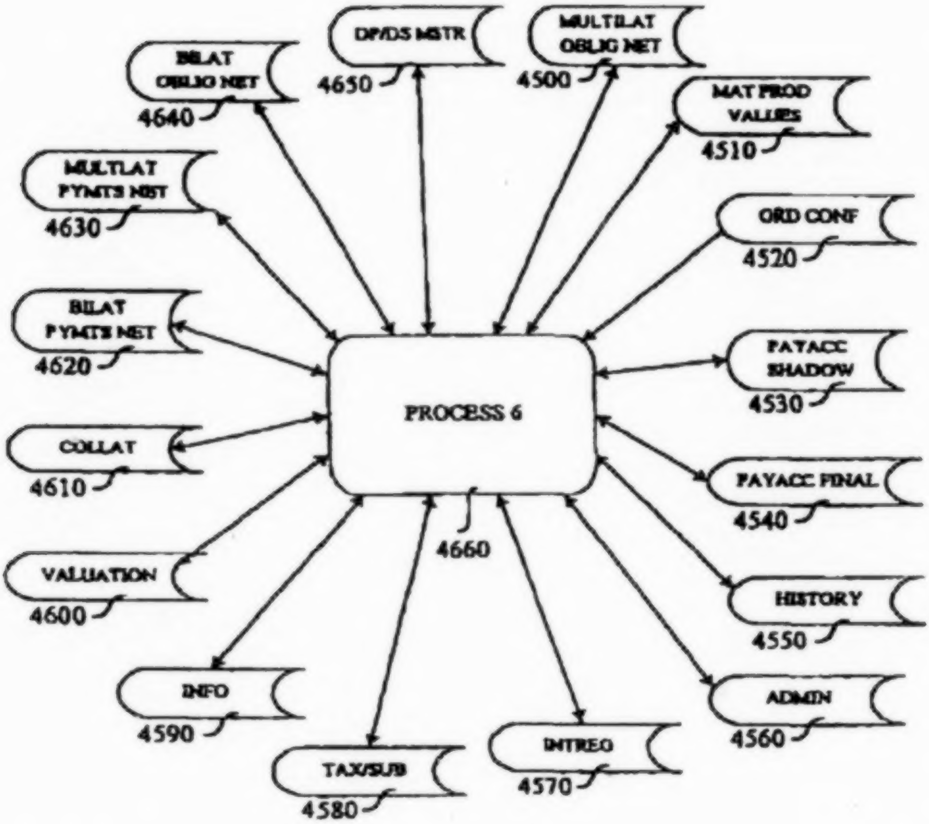

BILAT OBLIG NET
4640
DP/DS MSTR
4650
MULTILAT OBLIG NET
4500
MAT PROD VALUES
4510
MULTLAT PYMTS NET
4630
ORD CONF
4520
BILAT PYMTS NET
4620
PAYACC SHADOW
4530
PROCESS 6
COLLAT
4610
PAYACC FINAL
4540
4660
VALUATION
4600
HISTORY
4550
INFO
4590
ADMIN
4560
INTREQ
4570
TAX/SUB
4580

Fig. 23

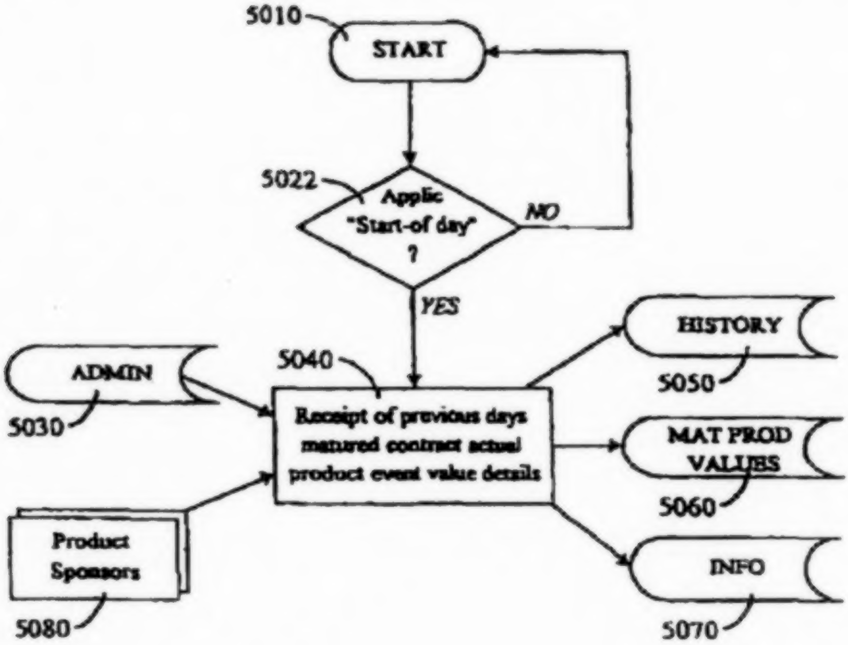

5010
START
5022
Applic
"Start-of day"
?
NO
YES
5040
Receipt of previous days matured contract actual product event value details
ADMIN
5030
Product Sponsors
5080
HISTORY
5050
MAT PROD VALUES
5060
INFO
5070

Fig. 24

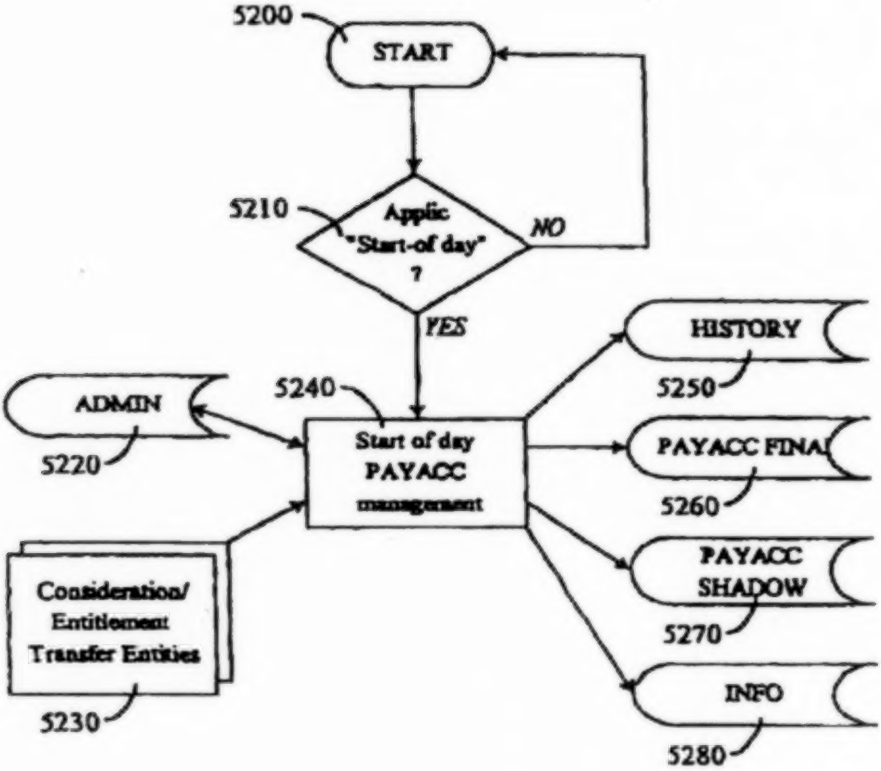

5200
START
5210
Applic
"Start-of day"
?
NO
YES
5240
Start of day
PAYACC
management
ADMIN
5220
Consideration/
Entitlement
Transfer Entities
5230
HISTORY
5250
PAYACC FINA
5260
PAYACC
SHADOW
5270
INFO
5280

Fig. 25

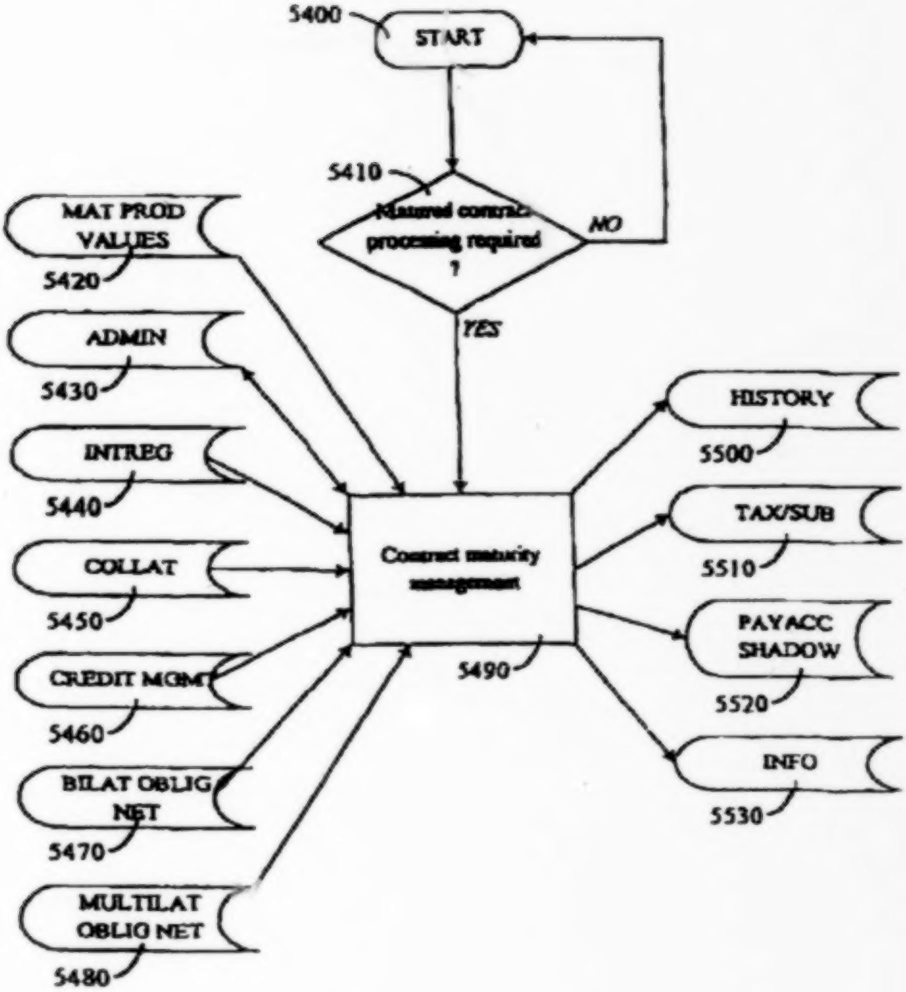

5400
START
5410
Matured contract processing required ?
NO
YES
MAT PROD VALUES
5420
ADMIN
5430
INTREG
5440
COLLAT
5450
CREDIT MGMT
5460
BILAT OBLIG NET
5470
MULTILAT OBLIG NET
5480
Contract maturity management
5490
HISTORY
5500
TAX/SUB
5510
PAYACC SHADOW
5520
INFO
5530

Fig. 26

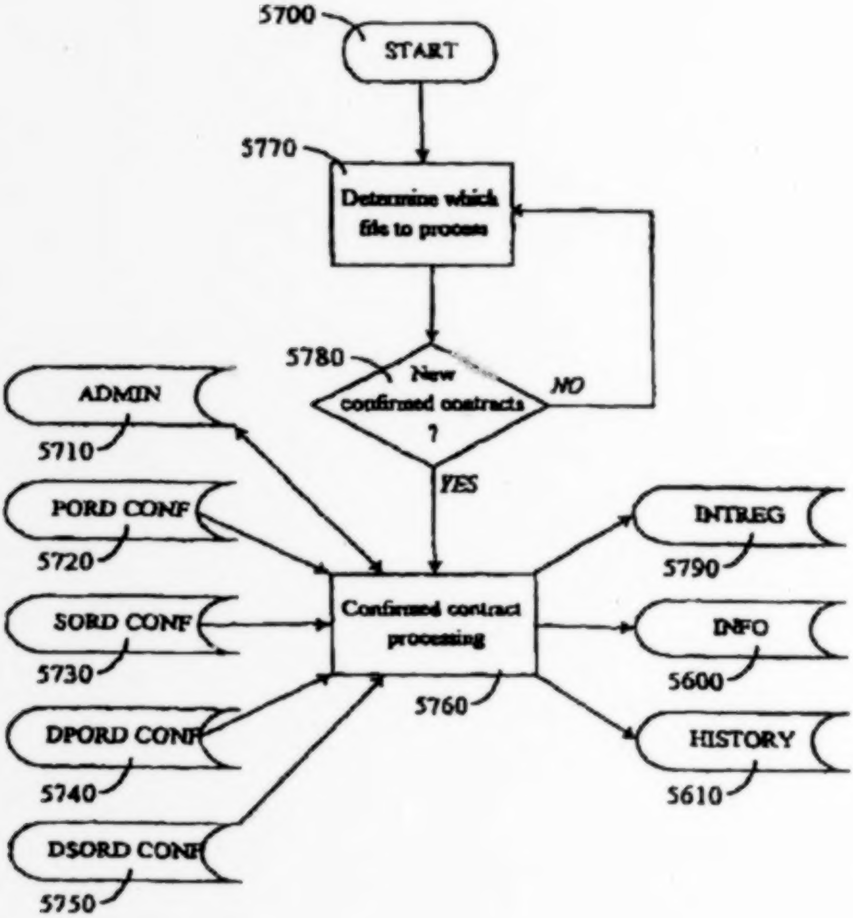
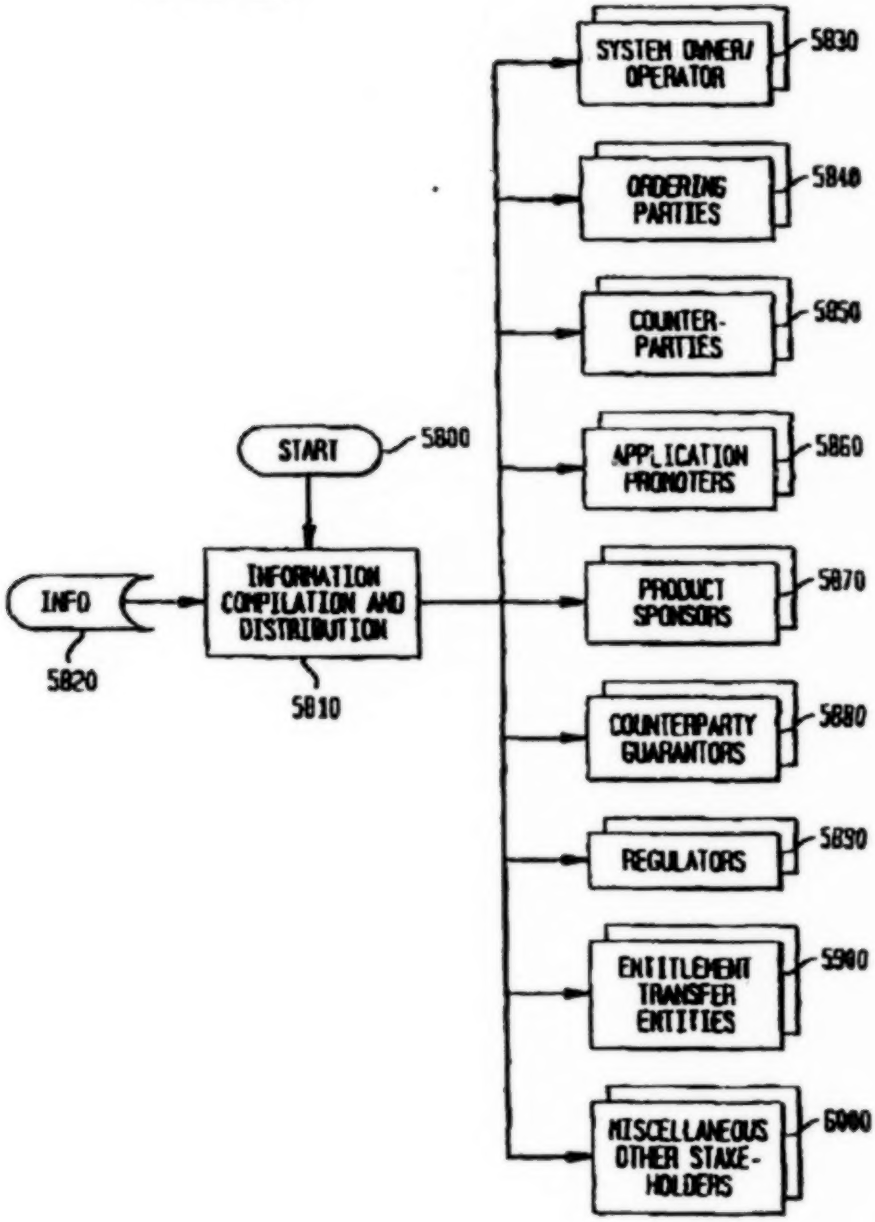

5700
START
5770
Determine which file to process
5780
New confirmed contracts ?
NO
YES
ADMIN
5710
PORD CONF
5720
SORD CONF
5730
DPORD CONF
5740
DSORD CONF
5750
Confirmed contract processing
5760
INTREG
5790
INFO
5600
HISTORY
5610

Fig 27

FIG. 28


START
5800
INFO
5820
INFORMATION COMPILATION AND DISTRIBUTION
5810
SYSTEM OWNER/ OPERATOR
5830
ORDERING PARTIES
5840
COUNTER-PARTIES
5850
APPLICATION PROMOTERS
5860
PRODUCT SPONSORS
5870
COUNTERPARTY GUARANTORS
5880
REGULATORS
5890
ENTITLEMENT TRANSFER ENTITIES
5900
MISCELLANEOUS OTHER STAKE-HOLDERS
6000

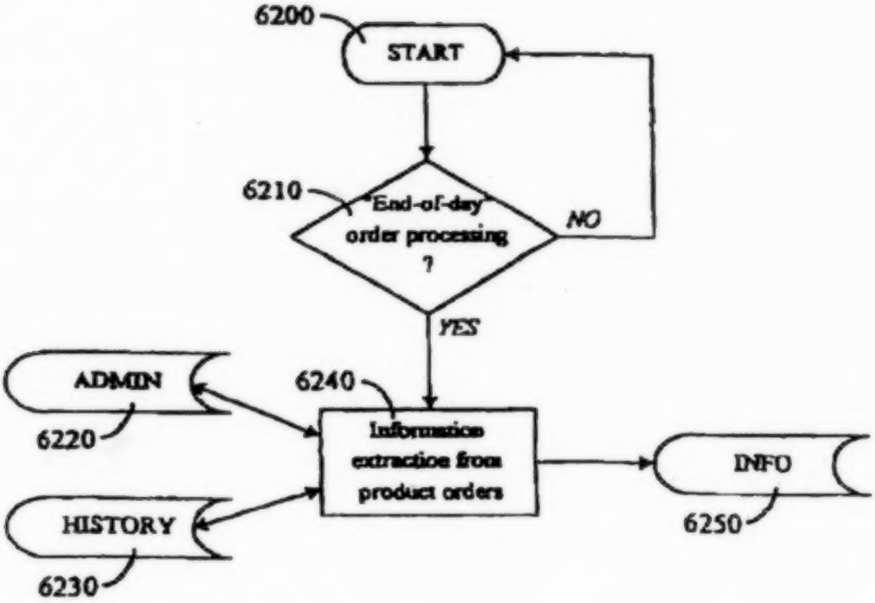

6200
START
6210
"End-of-day" order processing ?
NO
YES
ADMIN
6220
HISTORY
6230
6240
Information extraction from product orders
INFO
6250

Fig. 29

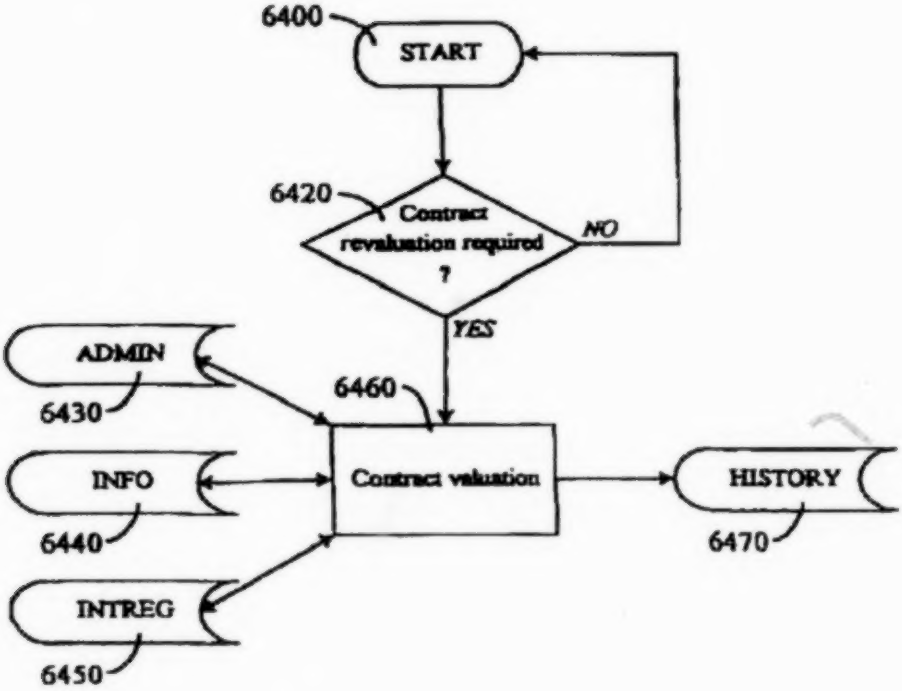

6400
START
6420
Contract revaluation required ?
NO
YES
ADMIN
6430
6460
INFO
6440
Contract valuation
HISTORY
6470
INTREG
6450

Fig. 30

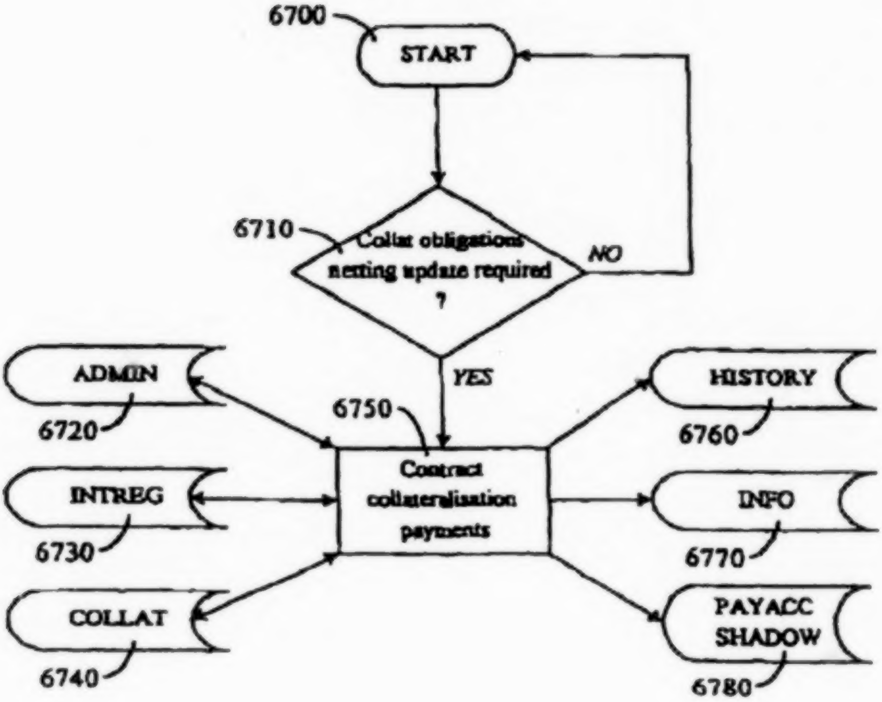

6700
START
6710
Collat obligations netting update required ?
NO
YES
ADMIN
6720
INTREG
6730
COLLAT
6740
6750
Contract collateralisation payments
HISTORY
6760
INFO
6770
PAYACC SHADOW
6780

Fig. 31

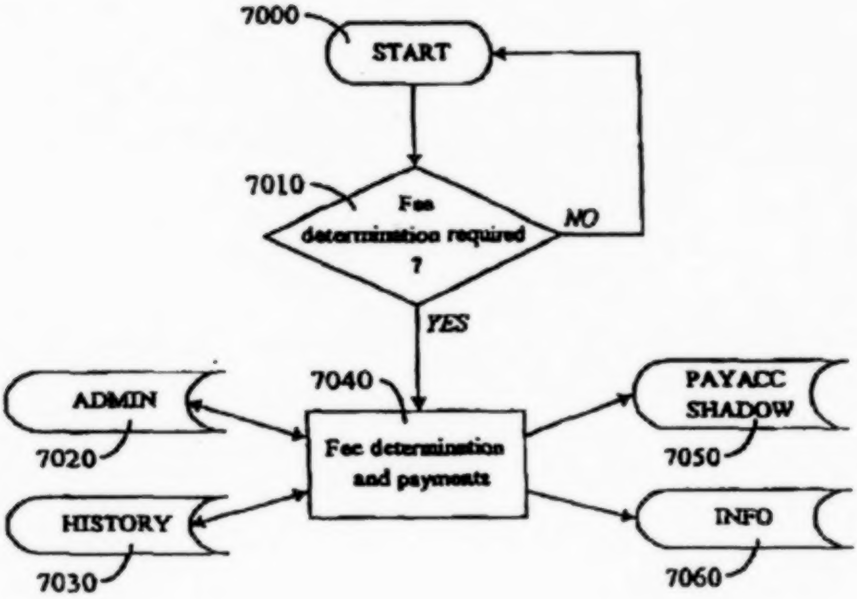

7000
START
7010
Fee determination required ?
NO
YES
7040
Fee determination and payments
ADMIN
7020
HISTORY
7030
PAYACC SHADOW
7050
INFO
7060

Fig. 32

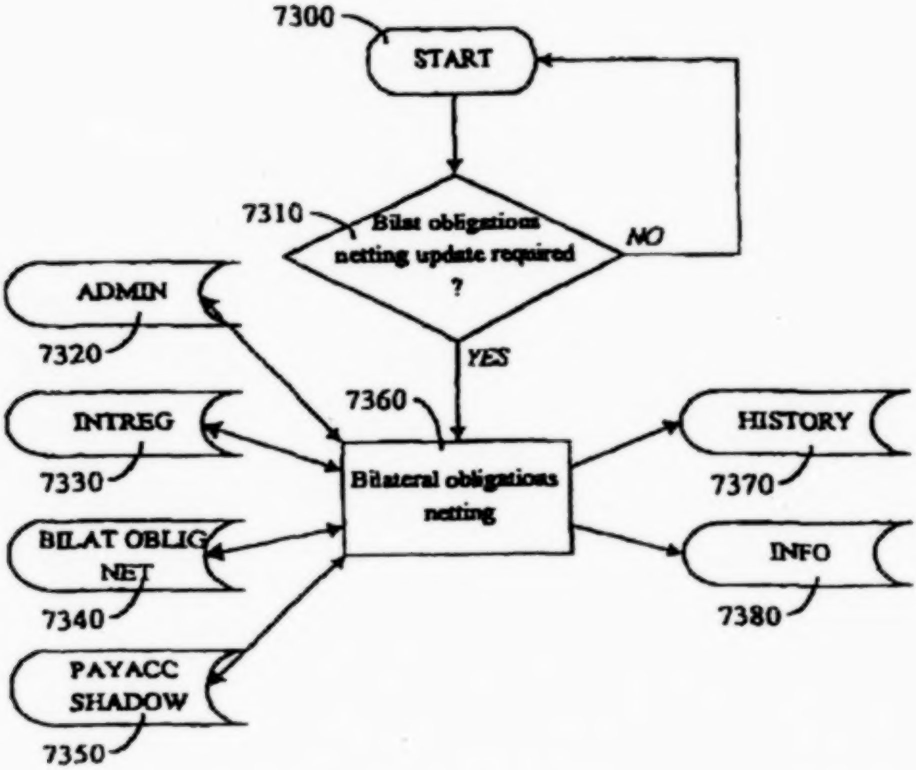

7300
START
7310
Bilat obligations netting update required ?
NO
YES
ADMIN
7320
INTREG
7330
BILAT OBLIG NET
7340
PAYACC SHADOW
7350
7360
Bilateral obligations netting
HISTORY
7370
INFO
7380

Fig. 33

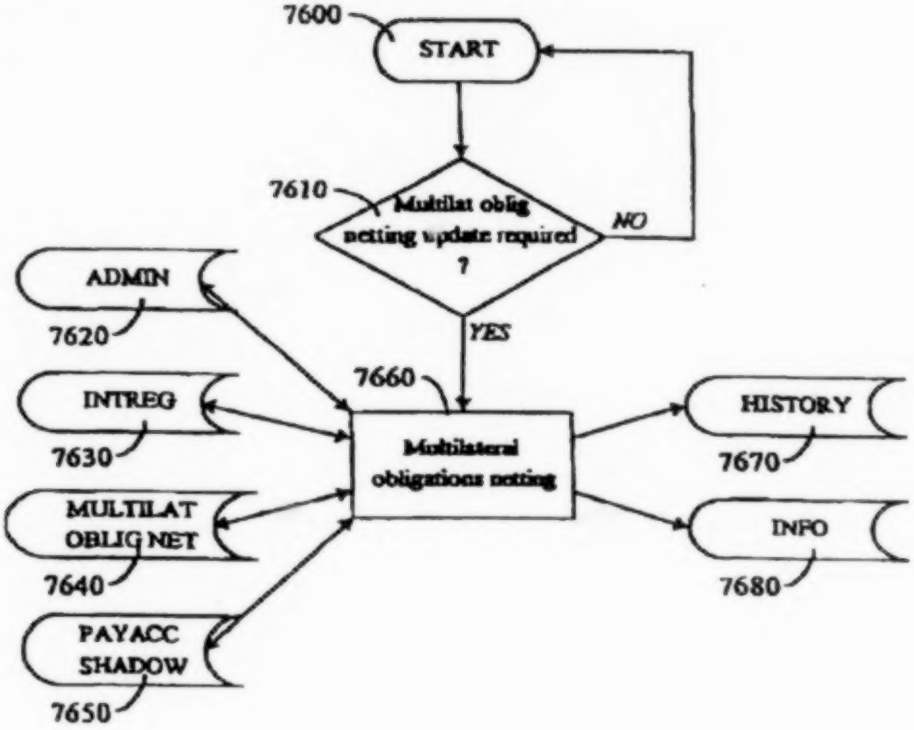

7600
START
7610
Multilat oblig netting update required ?
NO
YES
ADMIN
7620
INTREG
7630
MULTILAT OBLIG NET
7640
PAYACC SHADOW
7650
7660
Multilateral obligations netting
HISTORY
7670
INFO
7680

Fig. 34

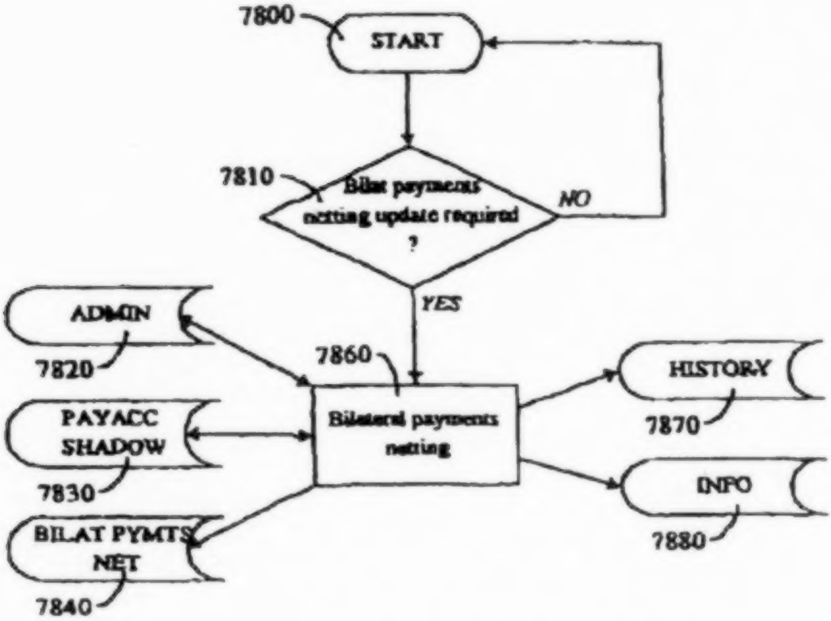

7800
START
7810
Bilat payments netting update required ?
NO
YES
ADMIN
7820
PAYACC SHADOW
7830
BILAT PYMTS NET
7840
7860
Bilateral payments netting
HISTORY
7870
INFO
7880

Fig. 35

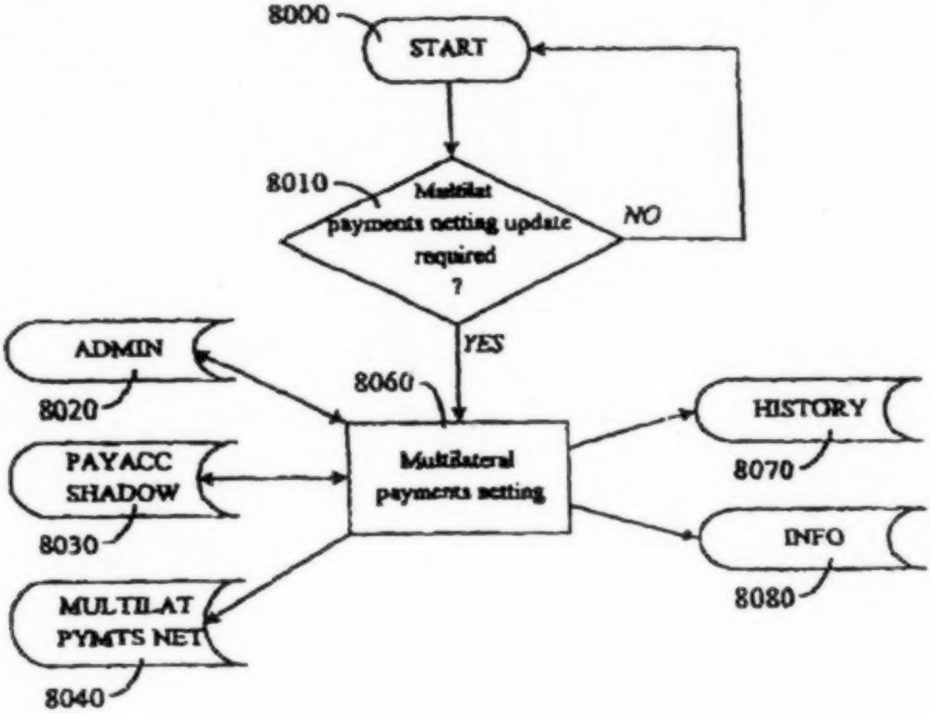

8000
START
8010
Multilat payments netting update required ?
NO
YES
ADMIN
8020
8060
Multilateral payments netting
PAYACC SHADOW
8030
MULTILAT PYMTS NET
8040
HISTORY
8070
INFO
8080

Fig. 36

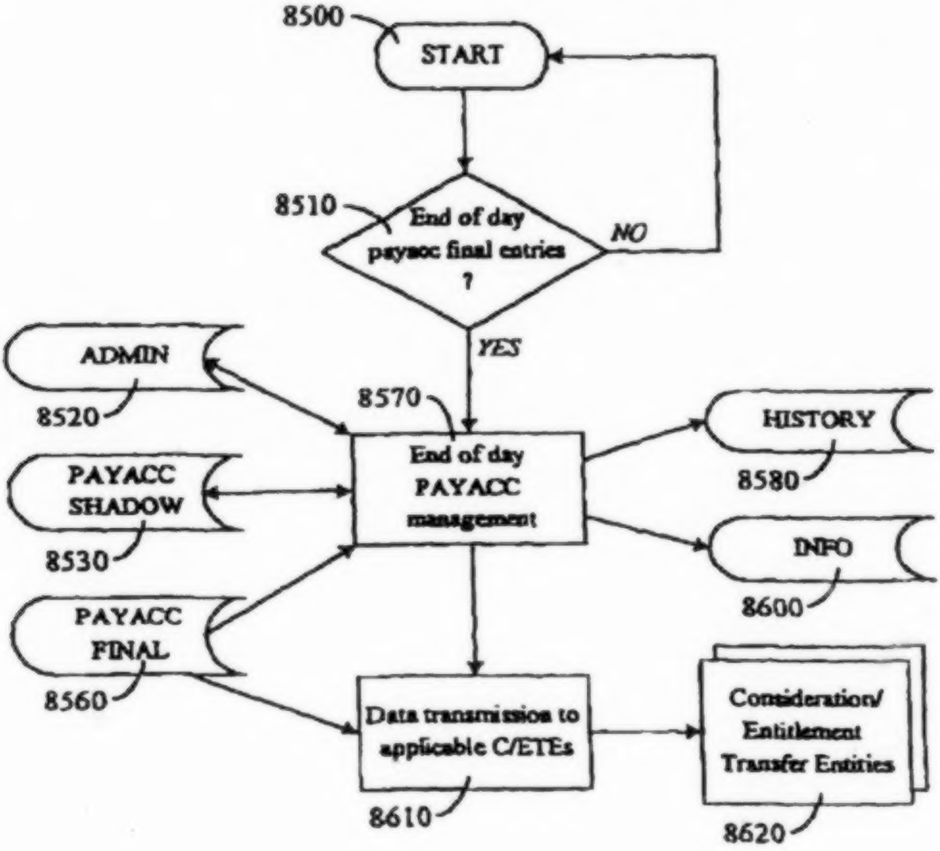

8500
START
8510
End of day payacc final entries ?
NO
YES
ADMIN
8520
8570
End of day PAYACC management
PAYACC SHADOW
8530
PAYACC FINAL
8560
HISTORY
8580
INFO
8600
Data transmission to applicable C/ETEs
8610
Consideration/ Entitlement Transfer Entities
8620

Fig. 37

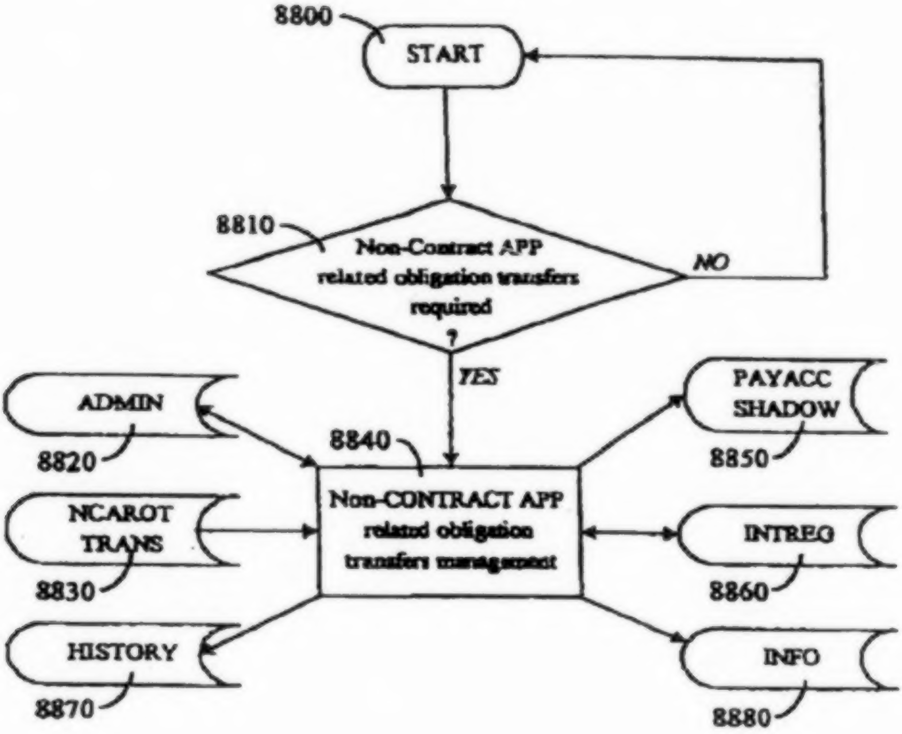

8800
START
8810
Non-Contract APP related obligation transfers required ?
NO
YES
ADMIN
8820
NCAROT TRANS
8830
HISTORY
8870
8840
Non-CONTRACT APP related obligation transfers management
PAYACC SHADOW
8850
INTREG
8860
INFO
8880

Fig. 38

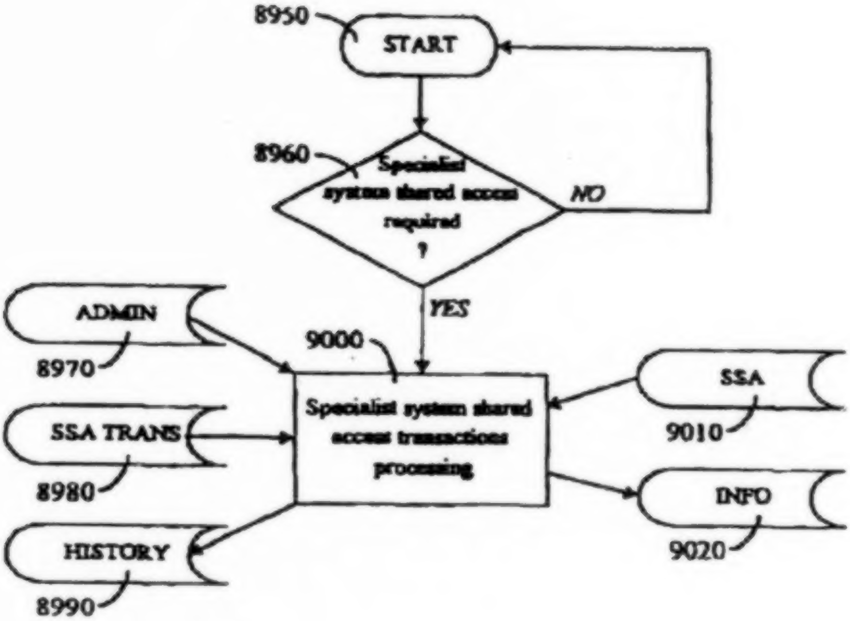

8950
START
8960
Specialist system shared access required ?
NO
YES
ADMIN
8970
9000
Specialist system shared access transactions processing
SSA
9010
SSA TRANS
8980
INFO
9020
HISTORY
8990

Fig. 39

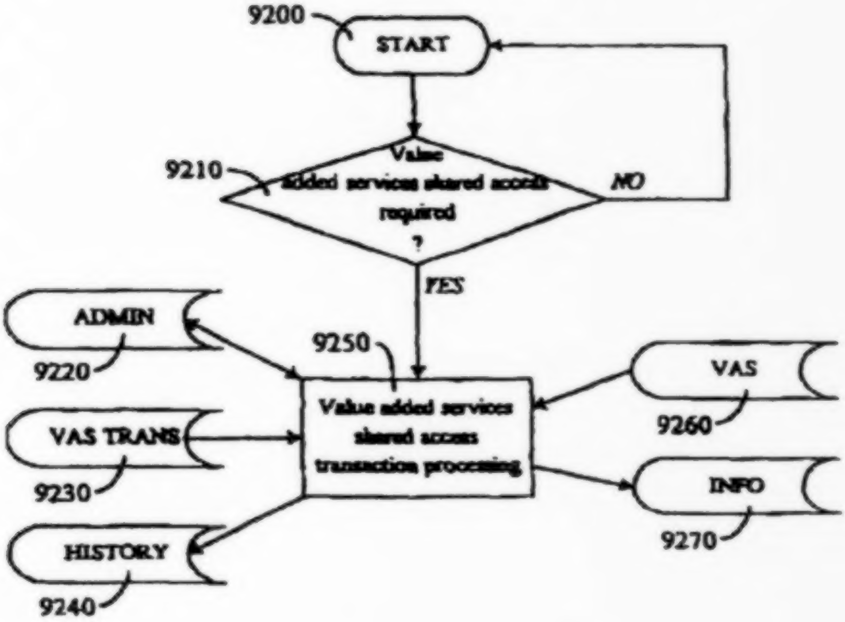

9200
START
9210
Value added services shared access required ?
NO
YES
ADMIN
9220
VAS TRANS
9230
HISTORY
9240
9250
Value added services shared access transaction processing
VAS
9260
INFO
9270

Fig. 40

EXAMPLE IV

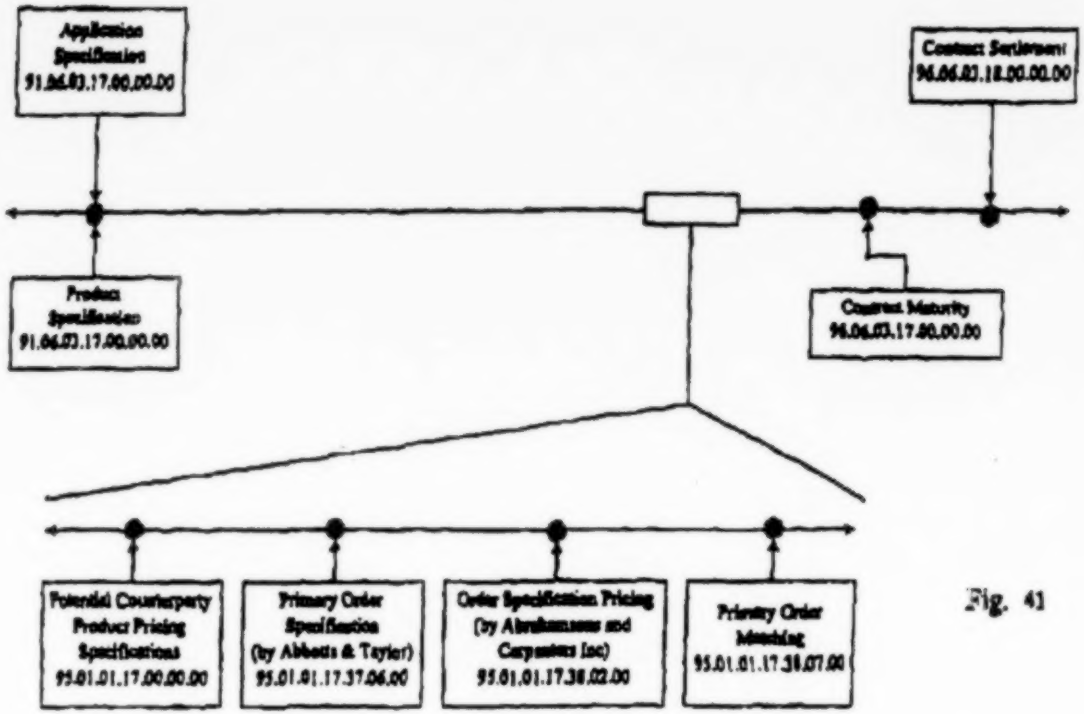

Application Specification 91.06.03.17.00.00.00
Product Specification 91.06.03.17.00.00.00
Contract Settlement 96.06.03.18.00.00.00
Contract Maturity 96.06.03.17.00.00.00
Potential Counterparty Product Pricing Specifications 95.01.01.17.00.00.00
Primary Order Specification (by Abbotts & Taylor) 95.01.01.17.37.06.00
Order Specification Pricing (by Abrahamsons and Carpenters Inc) 95.01.01.17.38.02.00
Primary Order Matching 95.01.01.17.38.07.00

Fig. 41

EXAMPLE V

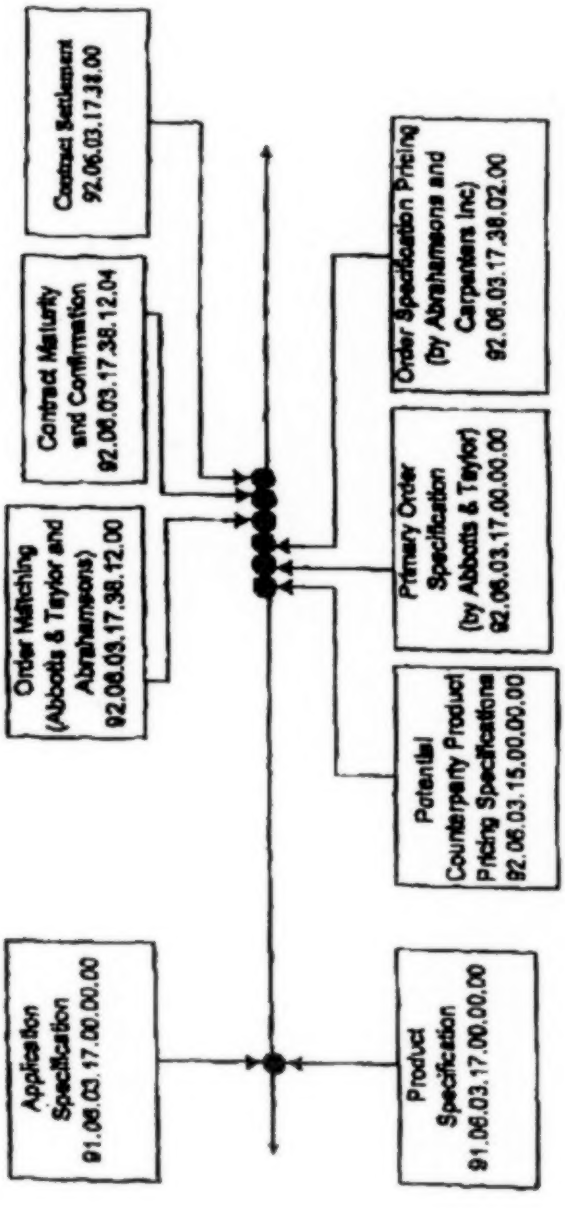
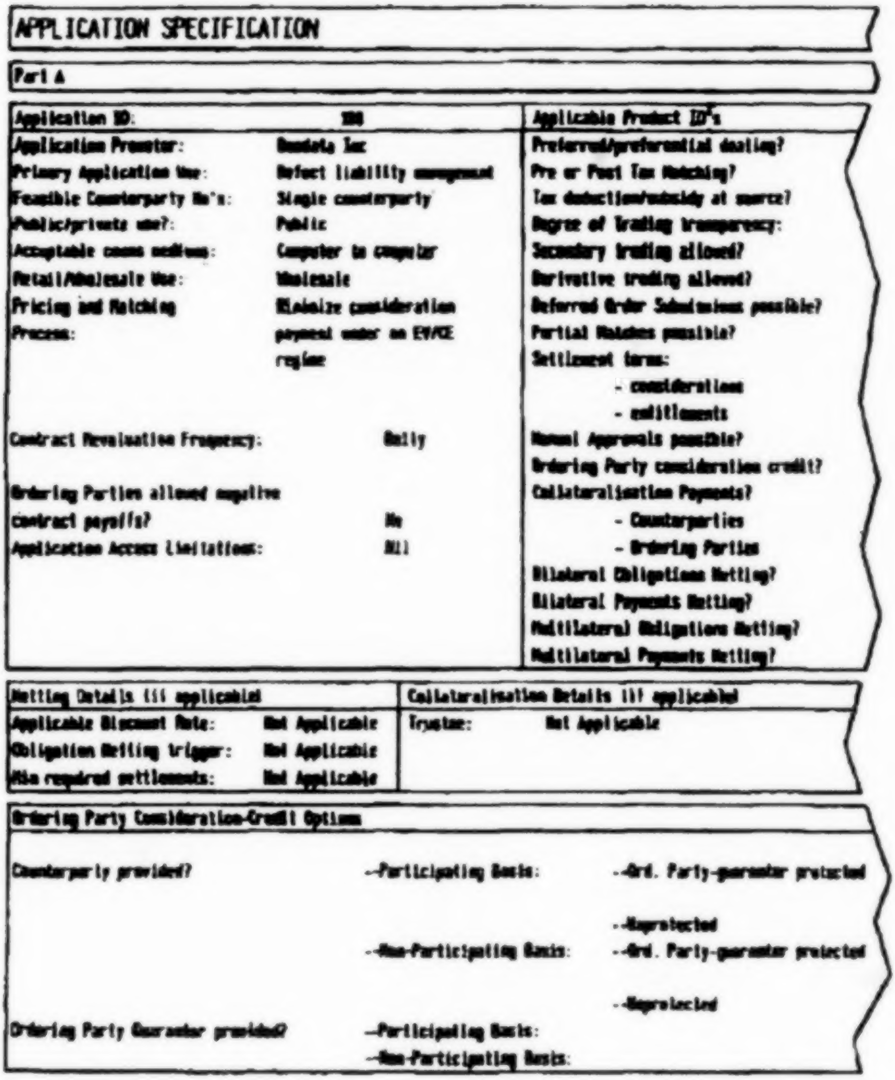

Application Specification 91.06.03.17.00.00.00
Order Matching (Abbotts & Taylor and Abrahamsons) 92.06.03.17.38.12.00
Contract Maturity and Confirmation 92.06.03.17.38.12.04
Contract Settlement 92.06.03.17.38.00
Product Specification 91.06.03.17.00.00.00
Potential Counterparty Product Pricing Specifications 92.06.03.15.00.00.00
Primary Order Specification (by Abbotts & Taylor) 92.06.03.17.00.00.00
Order Specification Pricing (by Abrahamsons and Carpenters Inc) 92.06.03.17.38.02.00

Fig. 42

FIG. 43A



APPLICATION SPECIFICATION

Part A

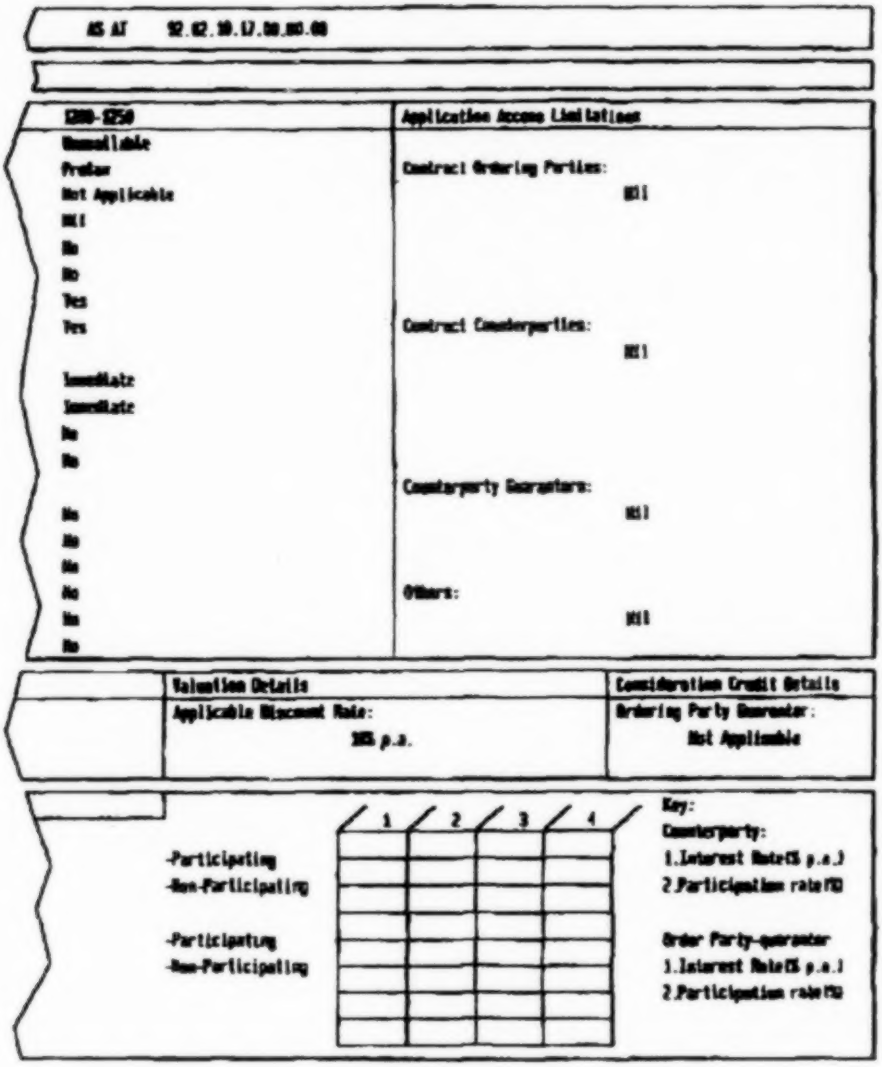
Application ID:	100	Applicable Product ID's
Application Promoter:	Bondata Inc	Preferred/preferential dealing?
Primary Application Use:	Default liability management	Pre or Post Tax Matching?
Feasible Counterparty No's:	Single counterparty	Tax deduction/subsidy at source?
Public/private use?:	Public	Degree of Trading transparency:
Acceptable comms mediums:	Computer to computer	Secondary trading allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading allowed?
Pricing and Matching Process:	Minimize consideration payment under an EV/CE regime	Deferred Order Submissions possible?
		Partial Matches possible?
		Settlement terms: - considerations - entitlements
Contract Revaluation Frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit?
Ordering Parties allowed negative contract payoffs?	No	Collateralisation Payments? - Counterparties - Ordering Parties
Application Access Limitations:	All	Bilateral Obligations Netting?
		Bilateral Payments Netting?
		Multilateral Obligations Netting?
		Multilateral Payments Netting?

Netting Details (if applicable)		Collateralisation Details (if applicable)	
Applicable Discount Rate:	Not Applicable	Trustee:	Not Applicable
Obligation Netting trigger:	Not Applicable		
Min required settlements:	Not Applicable		

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating Basis:	--Ord. Party-guarantor protected --Unprotected
	--Non-Participating Basis:	--Ord. Party-guarantor protected --Unprotected
Ordering Party Guarantor provided?	--Participating Basis:	
	--Non-Participating Basis:	

FIG. 43B



AS AT 92.02.10.17.00.00.00

$200-$250
Unavailable
Prefer
Not Applicable
Nil
No
No
Yes
Yes

Immediate
Immediate
No
No

No
No
No
No
No
No

Application Access Limitations

Contract Ordering Parties:
Nil

Contract Counterparties:
Nil

Counterparty Guarantors:
Nil

Others:
Nil

Valuation Details
Applicable Discount Rate:
10% p.a.

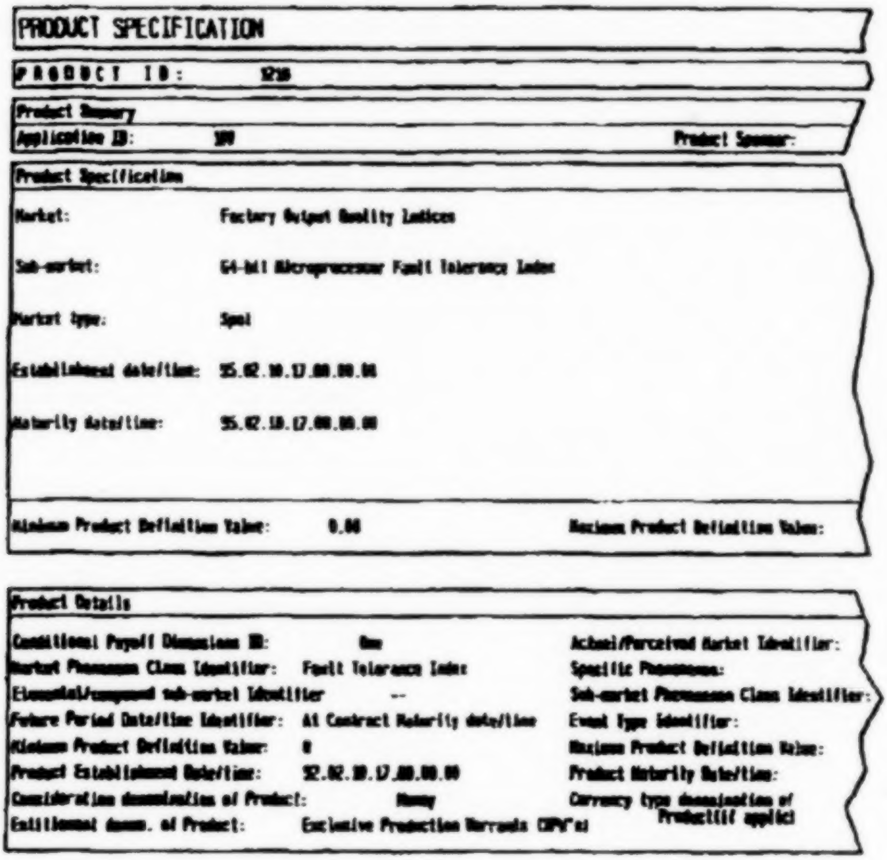
Consideration Credit Details
Ordering Party Guarantor:
Not Applicable

1
2
3
4
-Participating
-Non-Participating
-Participating
-Non-Participating

Key:
Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Order Party-guarantor
1.Interest Rate(% p.a.)
2.Participation rate(%)

FIG. 44A



PRODUCT SPECIFICATION

PRODUCT ID: 1210

Product Summary

Application ID: 100

Product Sponsor:

Product Specification

Market: Factory Output Quality Indices

Sub-market: 64-bit Microprocessor Fault Tolerance Index

Market type: Spot

Establishment date/time: 95.02.10.17.00.00.00

Maturity date/time: 95.02.10.17.00.00.00

Minimum Product Definition Value: 0.00

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Actual/Perceived Market Identifier:

Market Phenomenon Class Identifier: Fault Tolerance Index

Specific Phenomenon:

Elemental/compound sub-market Identifier --

Sub-market Phenomenon Class Identifier:

Future Period Date/time Identifier: At Contract Maturity date/time

Event Type Identifier:

Minimum Product Definition Value: 0

Maximum Product Definition Value:

Product Establishment Date/time: 92.02.10.17.00.00.00

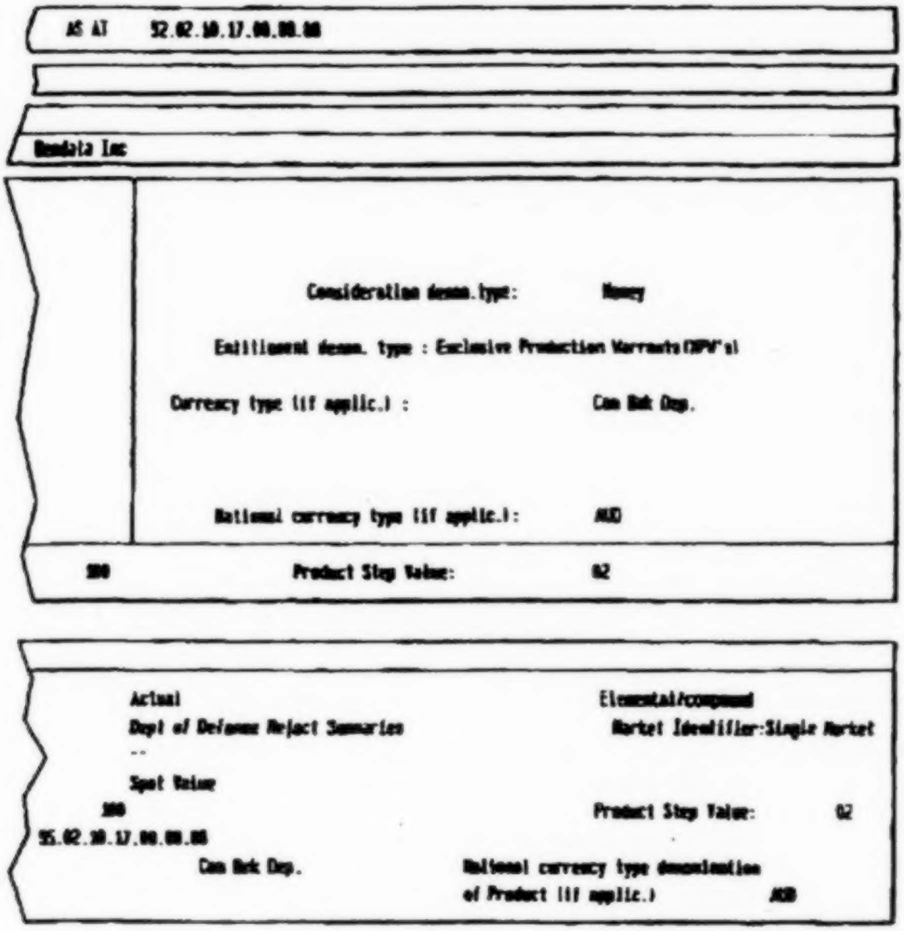
Product Maturity Date/time:

Consideration denomination of Product: Money

Currency type denomination of Product(if applic)

Entitlement denom. of Product: Exclusive Production Warrants (EPW's)

FIG. 44B



AS AT 92.02.10.17.00.00.00

Bondata Inc

Consideration denom.type: Money

Entitlement denom. type : Exclusive Production Warrants (EPW's)

Currency type (if applic.) : Com Bnk Dep.

National currency type (if applic.): AUD

100 Product Step Value: 02

Actual

Elemental/compound

Dept of Defense Reject Summaries

Market Identifier:Single Market

--

Spot Value

100

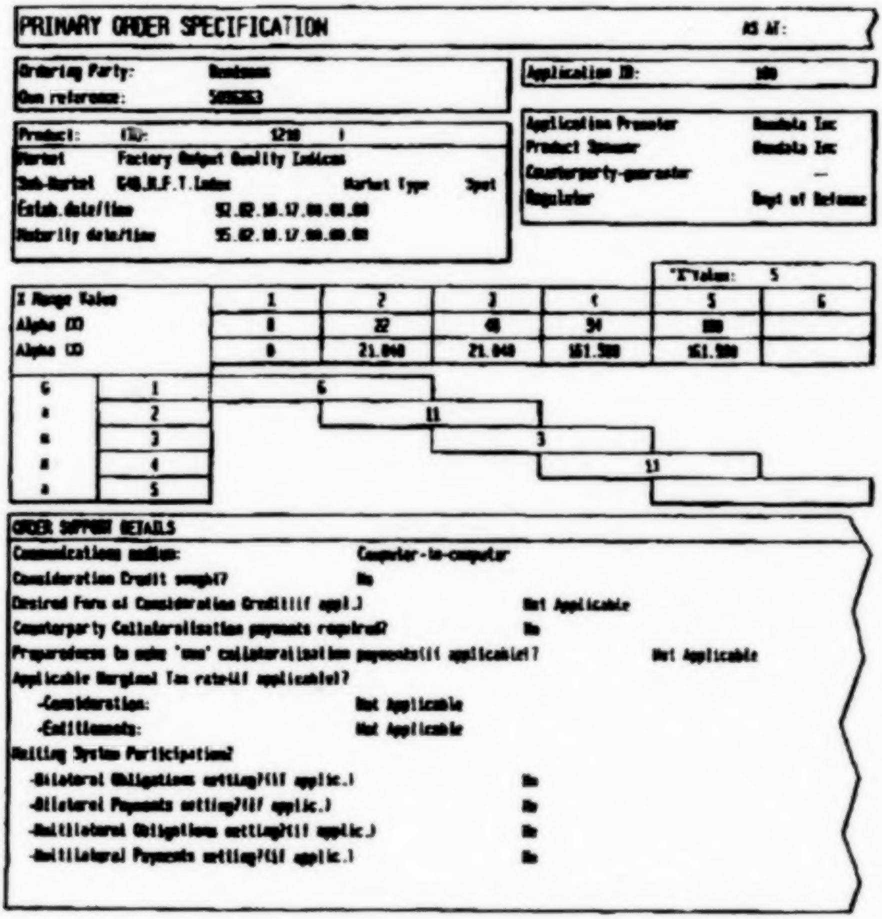
Product Step Value: 02

95.02.10.17.00.00.00

Com Bnk Dep.

National currency type denomination
of Product (if applic.) AUD

FIG. 45A



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: [illegible]
Own reference: [illegible]

Application ID: 100

Product: (Tk): 1210 I
Market Factory Output Quality Indices
Sub-Market G40.H.F.T.Index Market Type Spot
Estab. date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Application Promoter Bondata Inc
Product Sponsor Bondata Inc
Counterparty-guarantor —
Regulator Dept of Defense

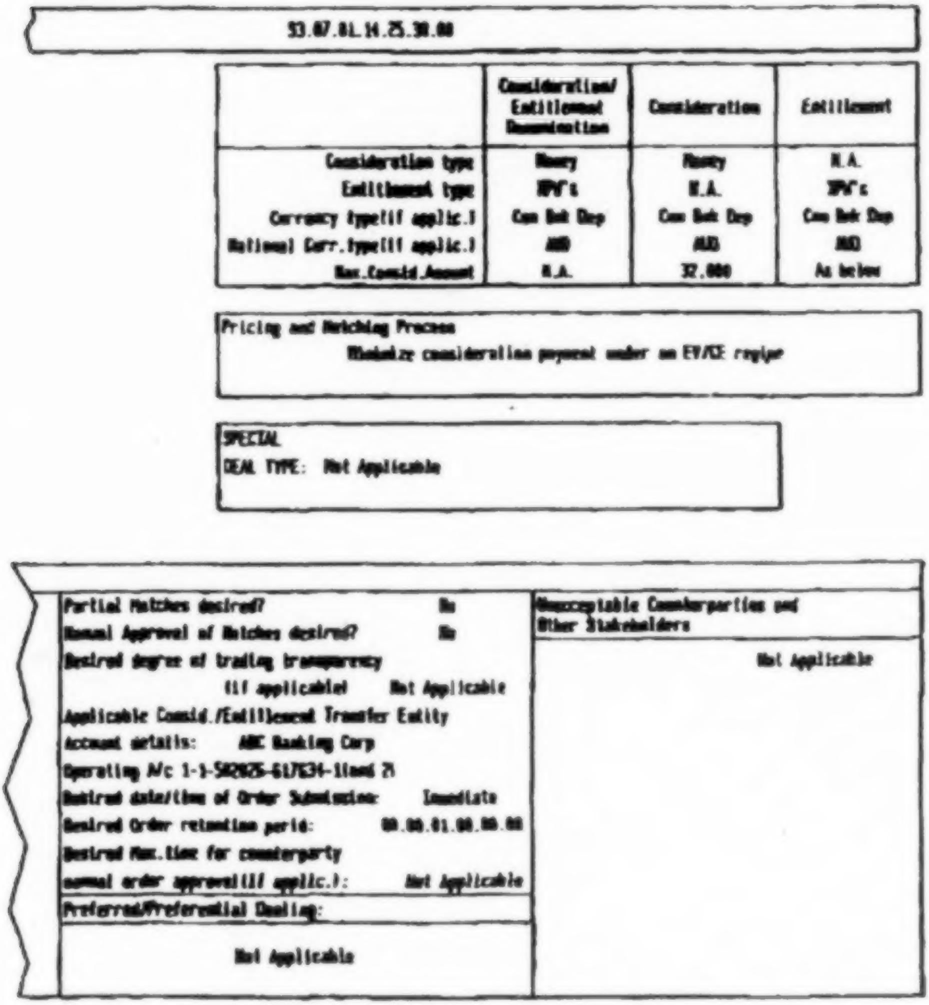
"X" Value: 5

X Range Value	1	2	3	4	5	6
Alpha (X)	0	22	48	94	100	
Alpha (X)	0	21.040	21.040	161.500	161.500	
Gamma 1	6					
Gamma 2		11				
Gamma 3			3			
Gamma 4				13		
Gamma 5						

ORDER SUPPORT DETAILS

Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? No
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 45B



53.07.01.14.25.30.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Consideration type	Money	Money	N.A.
Entitlement type	BPV's	N.A.	BPV's
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	32.000	As below

Pricing and Matching Process

Minimize consideration payment under an EV/CE regime

SPECIAL

DEAL TYPE: Not Applicable

Partial Matches desired? No

Manual Approval of Matches desired? No

Desired degree of trading transparency (if applicable) Not Applicable

Applicable Consid./Entitlement Transfer Entity

Account details: ABC Banking Corp

Operating A/c 1-1-502025-617634-1(and 2)

Desired date/time of Order Submission: Immediate

Desired Order retention period: 00.00.01.00.00.00

Desired Max.time for counterparty manual order approval(if applic.): Not Applicable

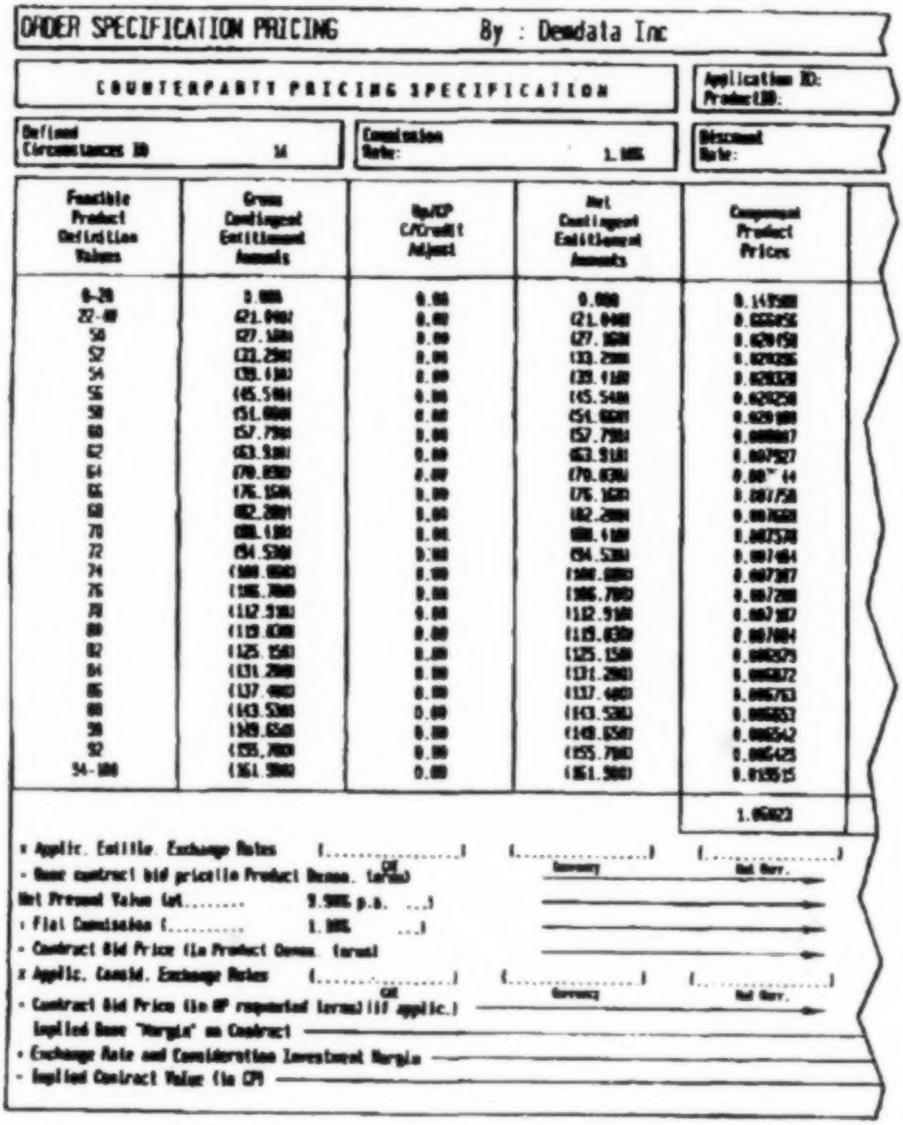
Preferred/Preferential Dealing:

Not Applicable

Unacceptable Counterparties and Other Stakeholders

Not Applicable

FIG. 46A



ORDER SPECIFICATION PRICING By : Demdata Inc

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID 16

Commission Rate: 1.00%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
0-20	0.000	0.00	0.000	0.145500
22-48	(21.0400)	0.00	(21.0400)	0.620056
50	(27.1600)	0.00	(27.1600)	0.029150
52	(33.2900)	0.00	(33.2900)	0.029026
54	(39.4100)	0.00	(39.4100)	0.029329
56	(45.5400)	0.00	(45.5400)	0.029250
58	(51.6600)	0.00	(51.6600)	0.029000
60	(57.7900)	0.00	(57.7900)	0.008067
62	(63.9100)	0.00	(63.9100)	0.007927
64	(70.0300)	0.00	(70.0300)	0.007844
66	(76.1600)	0.00	(76.1600)	0.007758
68	(82.2800)	0.00	(82.2800)	0.007668
70	(88.4100)	0.00	(88.4100)	0.007578
72	(94.5300)	0.00	(94.5300)	0.007484
74	(100.6600)	0.00	(100.6600)	0.007387
76	(106.7800)	0.00	(106.7800)	0.007288
78	(112.9100)	0.00	(112.9100)	0.007187
80	(119.0300)	0.00	(119.0300)	0.007084
82	(125.1500)	0.00	(125.1500)	0.006979
84	(131.2800)	0.00	(131.2800)	0.006872
86	(137.4000)	0.00	(137.4000)	0.006763
88	(143.5300)	0.00	(143.5300)	0.006653
90	(149.6500)	0.00	(149.6500)	0.006542
92	(155.7800)	0.00	(155.7800)	0.006425
94-100	(161.9000)	0.00	(161.9000)	0.015515
				1.05023

x Applic. Entitle. Exchange Rates (..................) (..................) (..................)
CPI Currency Nat Curr.
= Base contract bid price(in Product Denom. terms)
Net Present Value (at........ 9.50% p.a. ...)
+ Flat Commission (.......... 1.00% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (..................) (..................) (..................)
CPI Currency Nat Curr.
= Contract Bid Price (in CP requested terms)(if applic.)
Implied Base "Margin" on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (in CP)

FIG. 46B

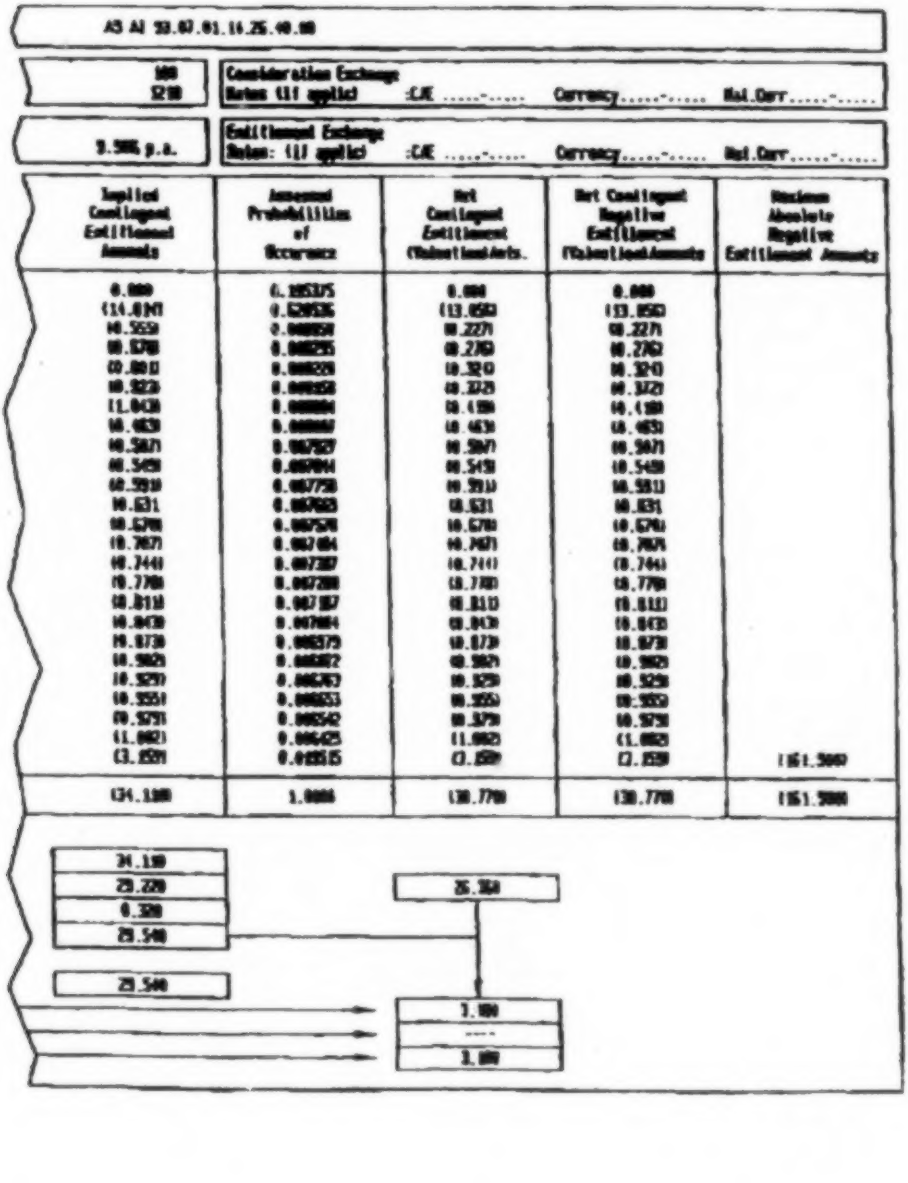
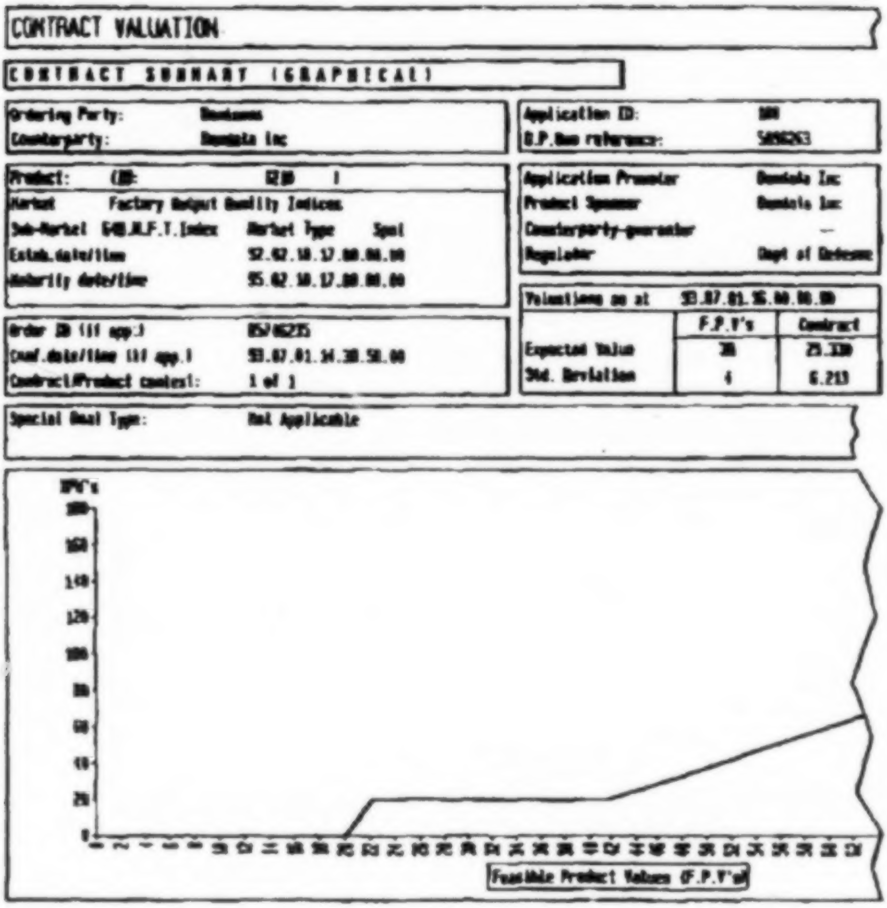

Consideration Exchange
Rates (if applic) :C/E ......-...... Currency......-...... Bal.Curr......-......
9.50% p.a.
Entitlement Exchange
Rates: (if applic) :C/E ......-...... Currency......-...... Bal.Curr......-......
Implied Contingent Entitlement Amounts
Assessed Probabilities of Occurrence
Net Contingent Entitlement (Valuation) Amts.
Net Contingent Negative Entitlement (Valuation) Amounts
Maximum Absolute Negative Entitlement Amounts
1.0000

FIG. 47A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Bankname
Counterparty: Dentata Inc

Product: (ID: 1210 1
Market Factory Output Quality Indices
Sub-Market G4B.N.F.T.Index Market Type Spot
Estab.date/time 92.02.10.17.00.00.00
Maturity date/time 95.02.10.17.00.00.00

Order ID (if app.) 85/06235
Conf.date/time (if app.) 93.07.01.14.30.50.00
Contract/Product contest: 1 of 1

Application ID: 100
G.P.Nos reference: 585263

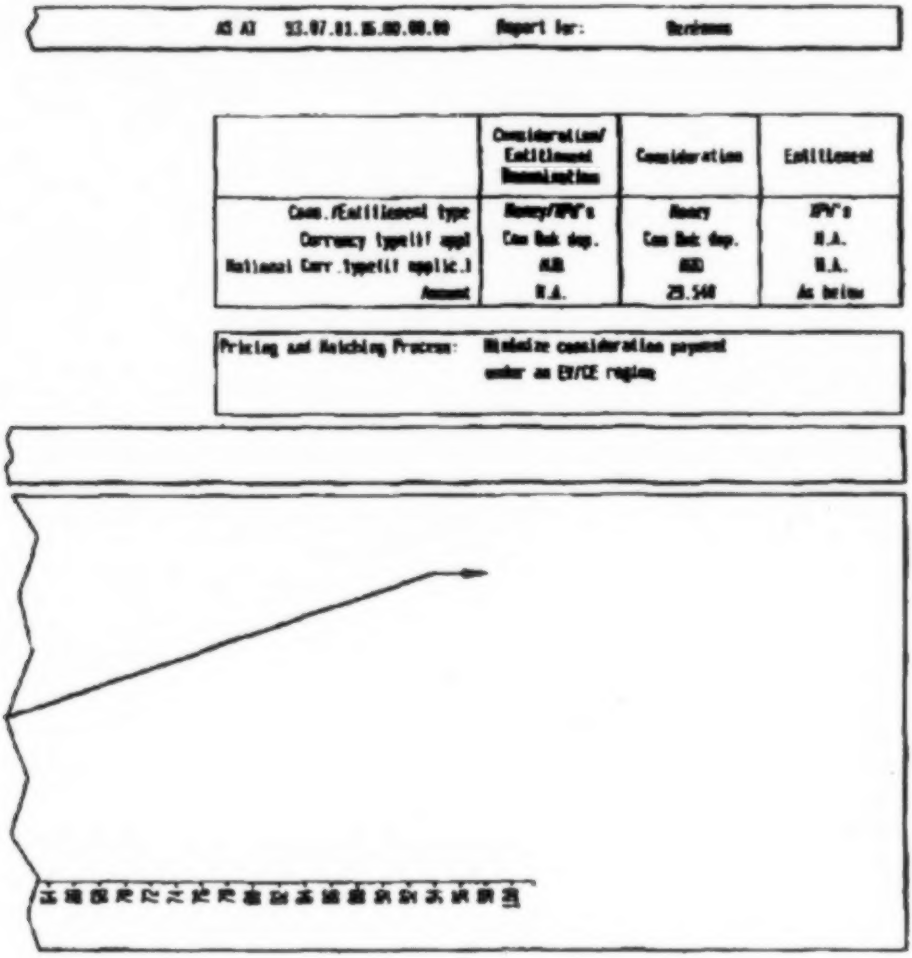
Application Promoter Dentata Inc
Product Sponsor Dentata Inc
Counterparty-guarantor —
Regulator Dept of Defense

Valuations as at 93.07.01.15.00.00.00

	F.P.V's	Contract
Expected Value	30	25.330
Std. Deviation	4	6.213

Special Deal Type: Not Applicable

FIG. 47B

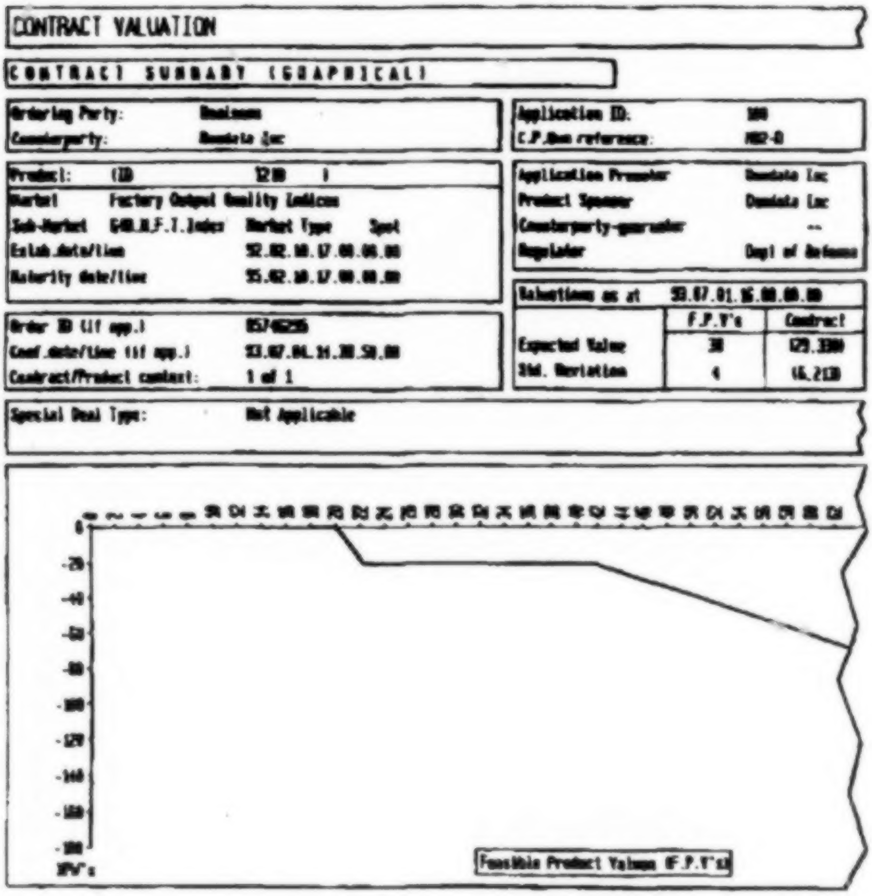


AS AT 53.07.01.15.00.00.00 Report for: [illegible]

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/XPV's	Money	XPV's
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	23.540	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

FIG. 4BA



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: [illegible]
Counterparty: Dundata Inc

Product: (ID 1210)
Market Factory Output Quality Indices
Sub-Market G40.Q.F.I.Index Market Type Spot
Estab.date/time 52.02.10.17.00.00.00
Maturity date/time 55.02.10.17.00.00.00

Order ID (if app.) 0574625
Conf.date/time (if app.) 53.07.04.11.30.50.00
Contract/Product context: 1 of 1

Application ID: 100
C.P.Own reference: M02-0

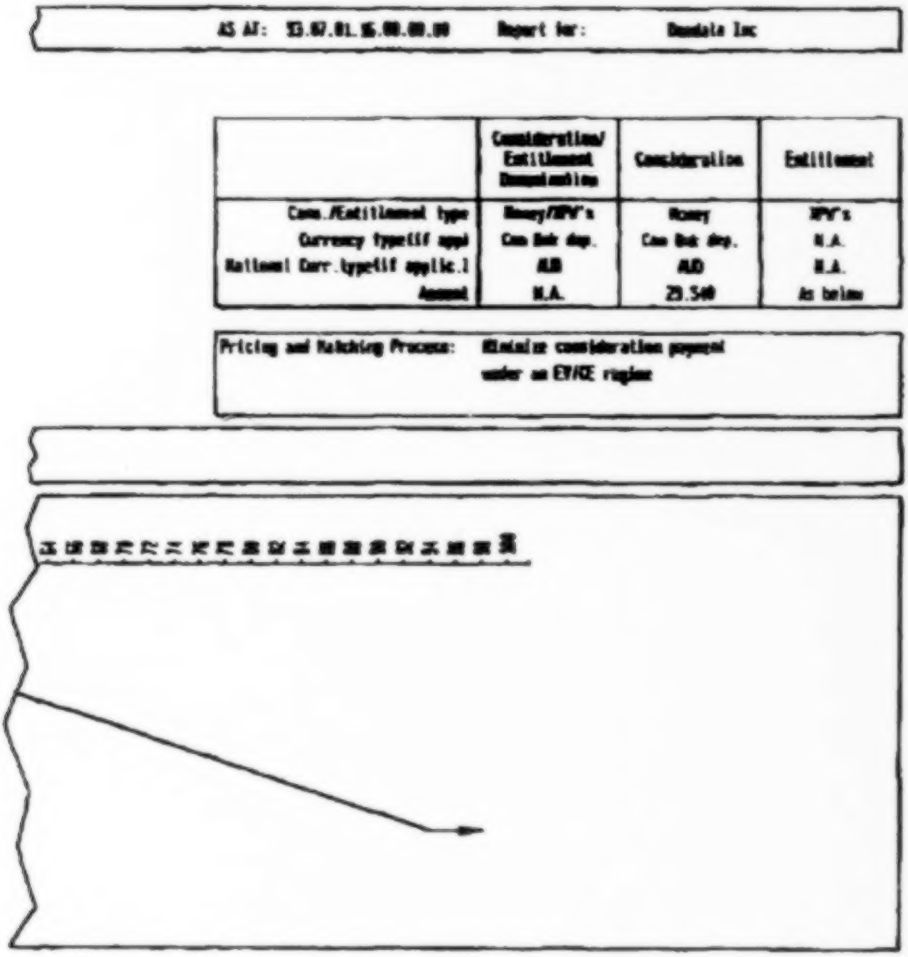
Application Promoter Dundata Inc
Product Sponsor Dundata Inc
Counterparty-guarantor --
Regulator Dept of Defense

Valuations as at 53.07.01.15.00.00.00

	F.P.V's	Contract
Expected Value	30	(29.330)
Std. Deviation	4	(6.213)

Special Deal Type: Not Applicable

FIG. 48B

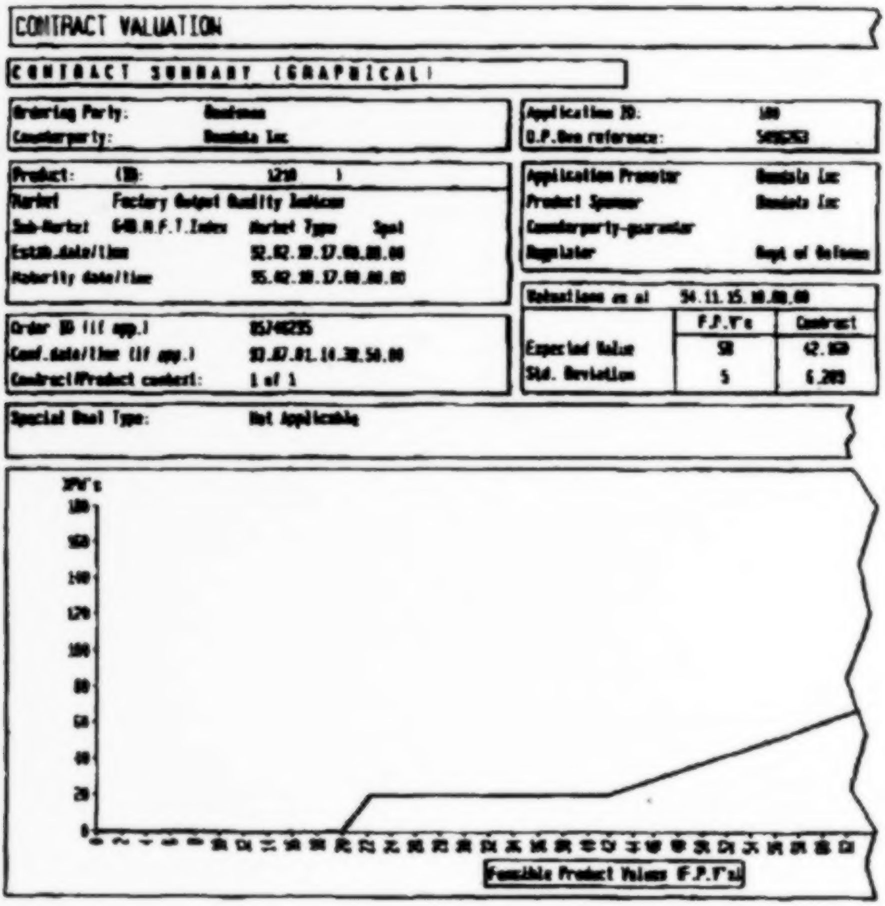


AS AT: 53.07.01.15.00.00.00 Report for: Dundale Inc

	Consideration/ Entitlement Computation	Consideration	Entitlement
Cons./Entitlement type	Money/XPV's	Money	XPV's
Currency type(if appl	Con Bnk dep.	Con Bnk dep.	N.A.
National Curr. type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	23.540	As below

Pricing and Matching Process: Minimize consideration payment under an EY/CE regime

FIG. 49A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Bondsman
Counterparty:	Bondola Inc

Application ID:	100
O.P.Bna reference:	5496253

Product: (ID: 1210)

Market	Factory Output Quality Indices		
Sub-Market	640.A.F.T.Index	Market Type	Spot
Estab.date/time		92.02.10.17.00.00.00	
Maturity date/time		95.02.10.17.00.00.00	

Application Promoter	Bondola Inc
Product Sponsor	Bondola Inc
Counterparty-guarantor	
Regulator	Dept of Defense

Order ID (if app.)	05740235
Conf.date/time (if app.)	93.07.01.14.30.50.00
Contract/Product content:	1 of 1

Valuations as at 94.11.15.10.00.00

	F.P.V's	Contract
Expected Value	58	42.669
Std. Deviation	5	6.203

Special Deal Type: Not Applicable

FIG. 49B

AS AT: 94.11.15.10.00.00.00 Report for: Denisons

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/XPV's	Money	XPV's
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	N.A.
National Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	25.540	As below

Pricing and Matching Process: Minimize consideration payout under an EV/CE regime

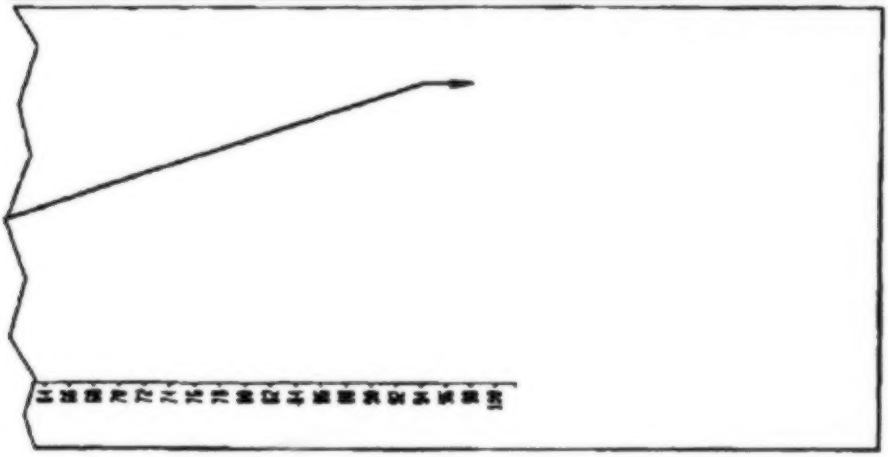
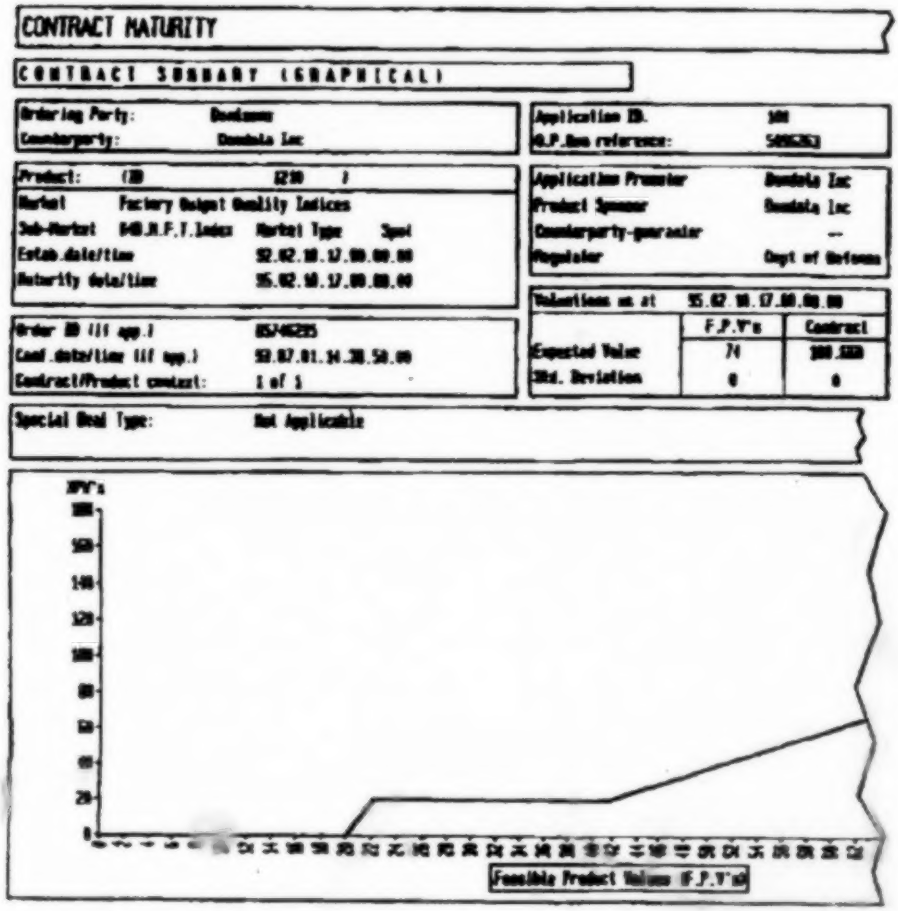


FIG. 50A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	[illegible]
Counterparty:	Dondala Inc

Application ID.	[illegible]
O.P. Doc reference:	[illegible]

Product: (ID 1210)

Market	Factory Output Quality Indices		
Sub-Market	640.N.F.T.Index	Market Type	Spot
Estab.date/time		92.02.10.17.00.00.00	
Maturity date/time		95.02.10.17.00.00.00	

Application Promoter	Dondala Inc
Product Sponsor	Dondala Inc
Counterparty-guarantor	--
Regulator	Dept of Defense

Order ID (if app.)	[illegible]
Conf.date/time (if app.)	93.07.01.14.30.50.00
Contract/Product context:	1 of 1

Valuations as at 95.02.10.17.00.00.00

	F.P.V's	Contract
Expected Value	74	[illegible]
Std. Deviation	0	0

Special Deal Type: Not Applicable

FIG. 50B

AS AT: 95.02.10.17.00.00.00 Report for: Dentsons

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money/XPV's	Money	XPV's
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	N.A.
Notional Curr.type(if applic.)	AUD	AUD	N.A.
Amount	N.A.	29,540	As below

Pricing and Matching Process: Minimize consideration payment under an EY/CE regime

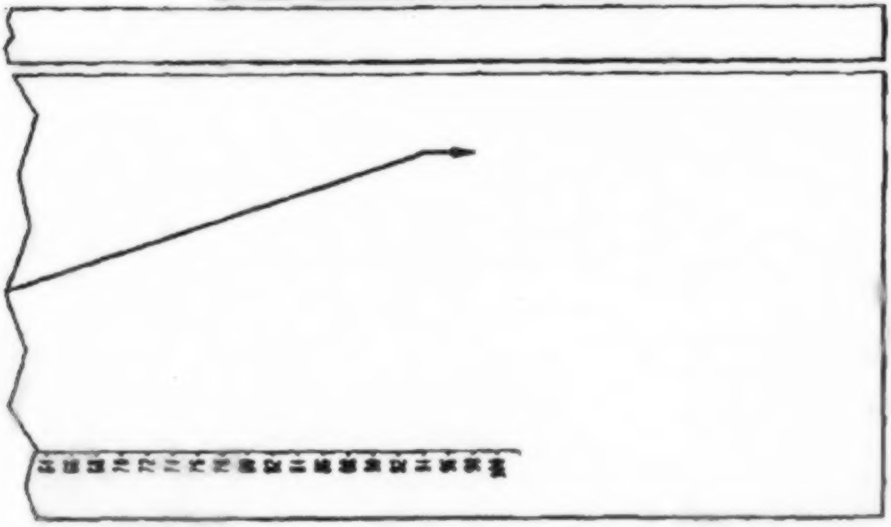
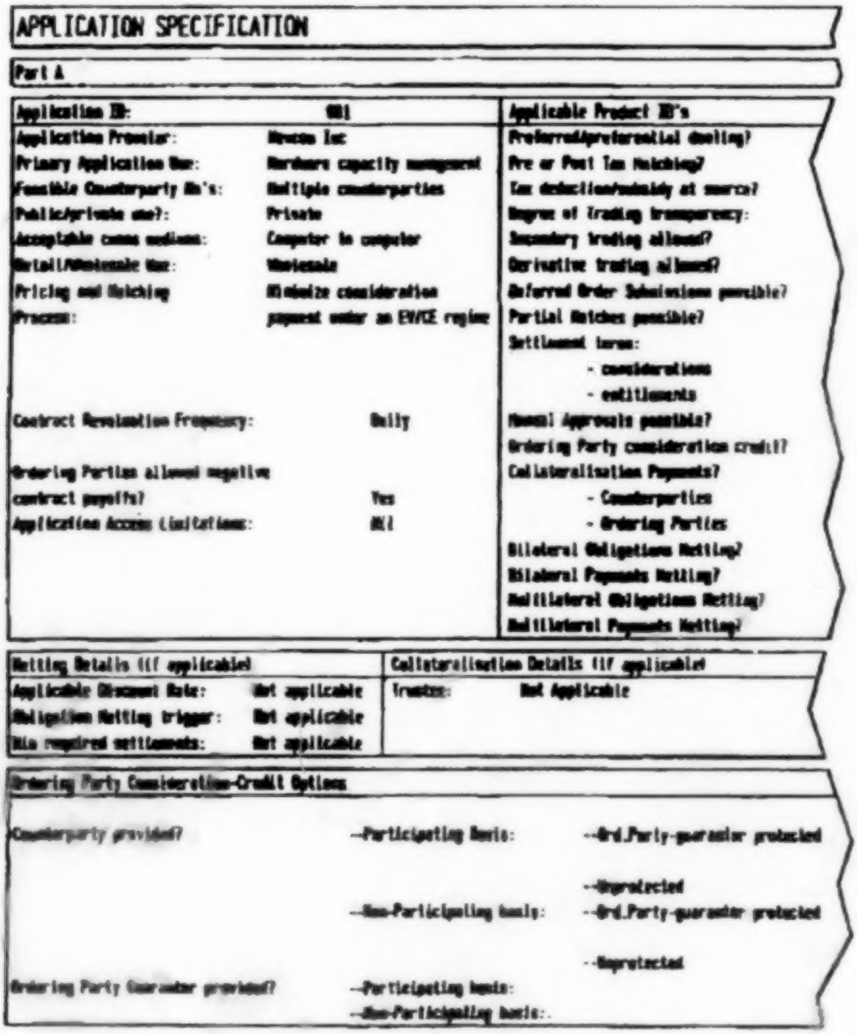


FIG. 51A



APPLICATION SPECIFICATION

Part A

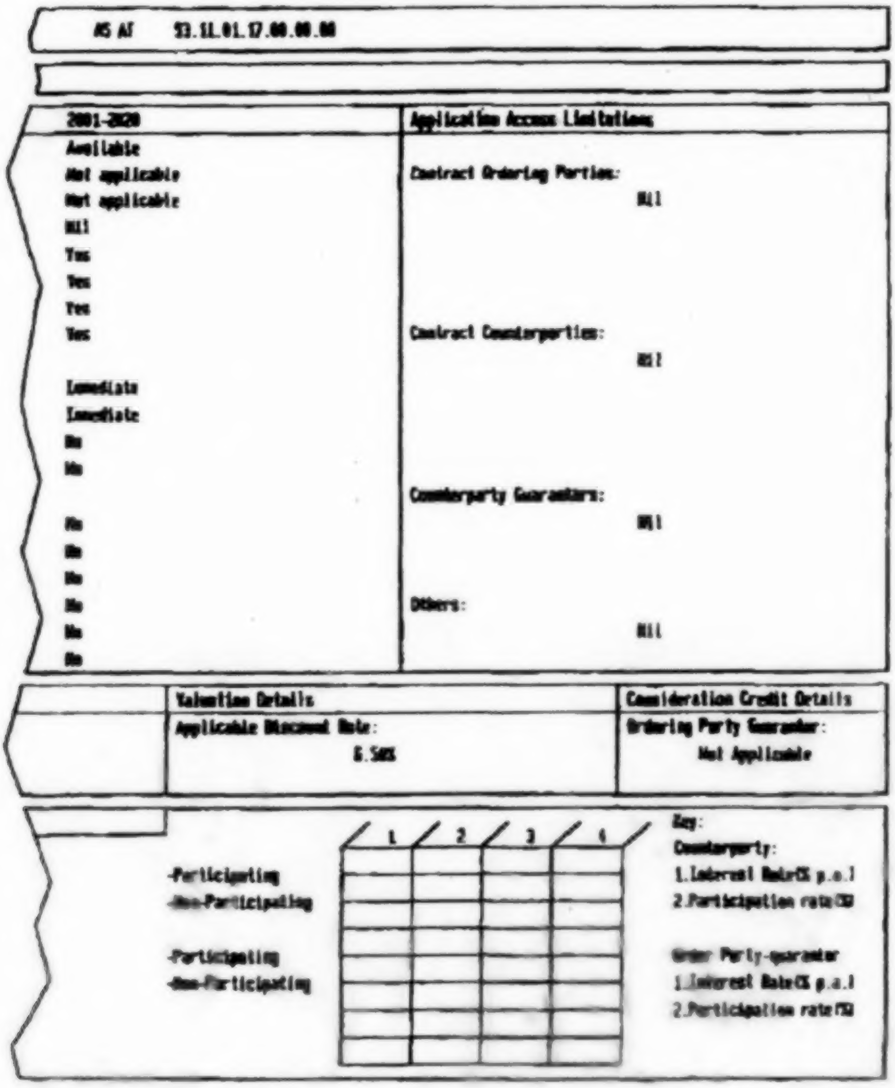
Application ID:	001	Applicable Product ID's
Application Provider:	Nexcom Inc	Preferred/preferential dealing?
Primary Application Use:	Hardware capacity management	Pre or Post Tax Matching?
Feasible Counterparty No's:	Multiple counterparties	Tax deduction/subsidy at source?
Public/private use?:	Private	Degree of trading transparency:
Acceptable comms mediums:	Computer to computer	Secondary trading allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading allowed?
Pricing and Matching	Minimize consideration	Deferred Order Submissions possible?
Process:	payment under an EV/CE regime	Partial Matches possible?
		Settlement terms: - considerations - entitlements
Contract Revaluation Frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit?
Ordering Parties allowed negative contract payoffs?	Yes	Collateralisation Payments? - Counterparties - Ordering Parties
Application Access Limitations:	All	Bilateral Obligations Netting? Bilateral Payments Netting? Multilateral Obligations Netting? Multilateral Payments Netting?

Netting Details (if applicable)		Collateralisation Details (if applicable)	
Applicable Discount Rate:	Not applicable	Trustee:	Not Applicable
Obligation Netting trigger:	Not applicable		
Min required settlements:	Not applicable		

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating Basis:	--Ord.Party-guarantor protected --Unprotected
	--Non-Participating basis:	--Ord.Party-guarantor protected --Unprotected
Ordering Party Guarantor provided?	--Participating basis:	
	--Non-Participating basis:.	

FIG. 51B



AS AT 53.11.01.17.00.00.00

2001-2020
Available
Not applicable
Not applicable
Nil
Yes
Yes
Yes
Yes

Immediate
Immediate
No
No

No
No
No
No
No
No

Application Access Limitations

Contract Ordering Parties:
Nil

Contract Counterparties:
Nil

Counterparty Guarantors:
Nil

Others:
Nil

Valuation Details
Applicable Discount Rate:
6.50%

Consideration Credit Details
Ordering Party Guarantor:
Not Applicable

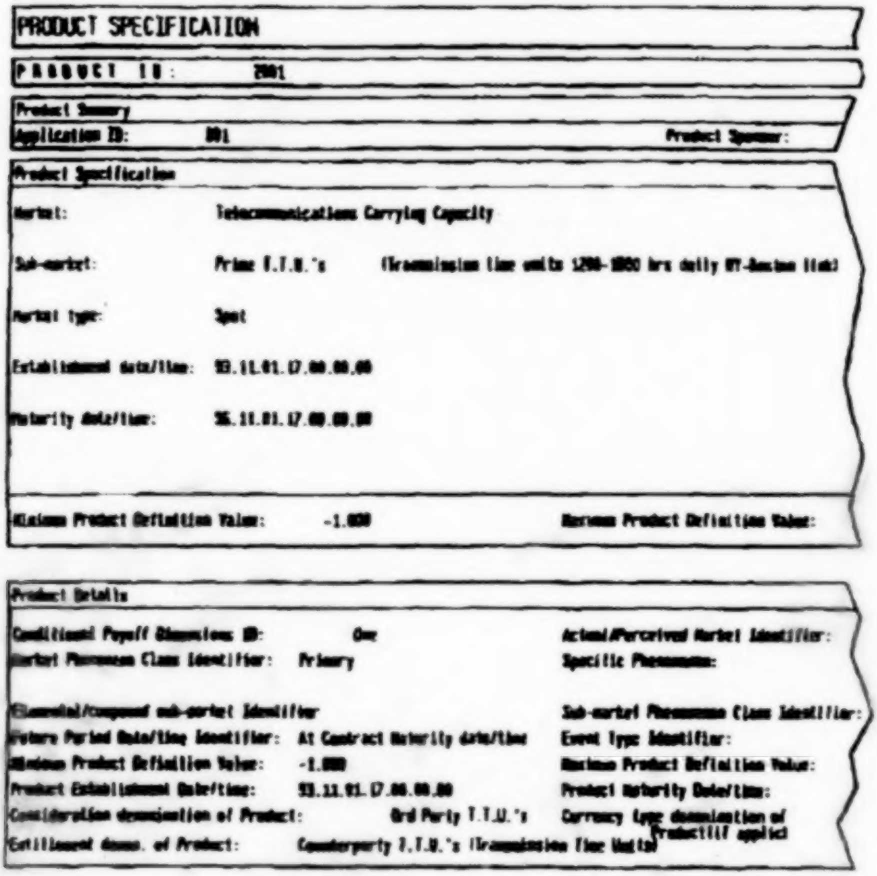
-Participating
-Non-Participating

-Participating
-Non-Participating

Key:
Counterparty:
1.Interest Rate(% p.a.)
2.Participation rate(%)

Order Party-guarantor
1.Interest Rate(% p.a.)
2.Participation rate(%)

FIG. 52A



PRODUCT SPECIFICATION

PRODUCT ID: 2001

Product Summary

Application ID: 001

Product Sponsor:

Product Specification

Market: Telecommunications Carrying Capacity

Sub-market: Prime T.T.U.'s (Transmission time units 1200-1800 hrs daily NY-Boston link)

Market type: Spot

Establishment date/time: 93.11.01.17.00.00.00

Maturity date/time: 95.11.01.17.00.00.00

Minimum Product Definition Value: -1.000

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Actual/Perceived Market Identifier:

Market Phenomenon Class Identifier: Primary

Specific Phenomenon:

Elemental/compound sub-market Identifier

Sub-market Phenomenon Class Identifier:

Future Period Date/time Identifier: At Contract Maturity date/time

Event Type Identifier:

Minimum Product Definition Value: -1.000

Maximum Product Definition Value:

Product Establishment Date/time: 93.11.01.17.00.00.00

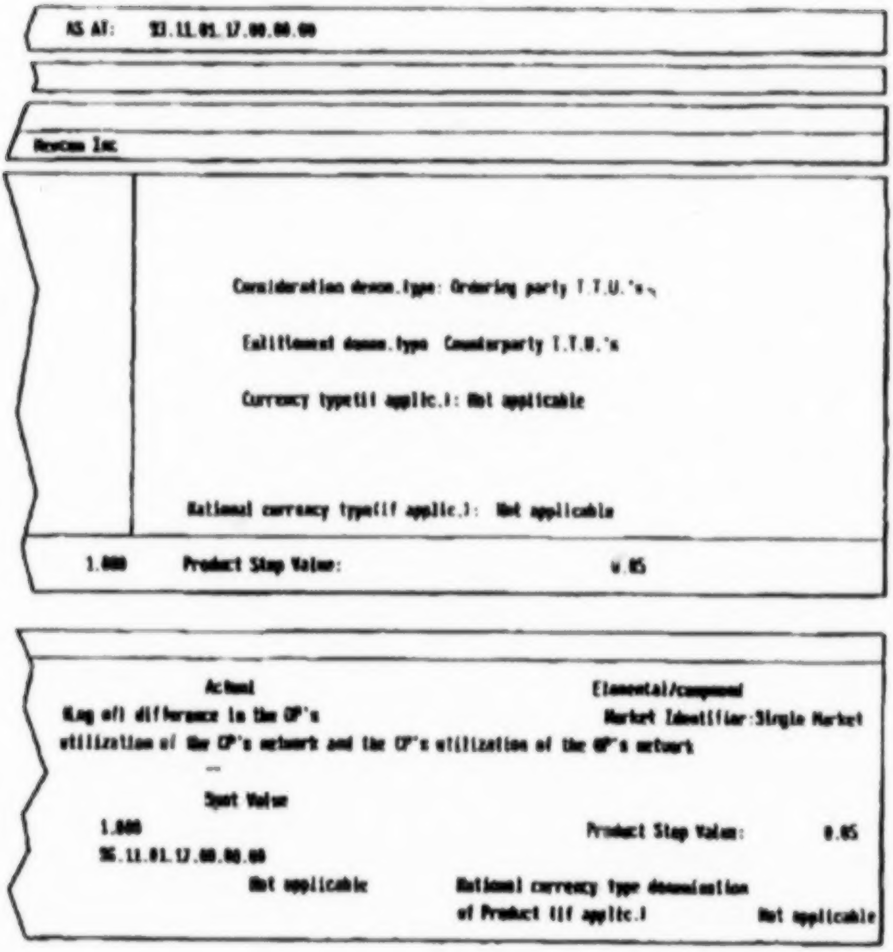
Product Maturity Date/time:

Consideration denomination of Product: 3rd Party T.T.U.'s

Currency type denomination of Product(if applic)

Settlement denom. of Product: Counterparty T.T.U.'s (Transmission Time Units)

FIG. 52B



AS AT: 93.11.01.17.00.00.00

Newcom Inc

Consideration denom.type: Ordering party I.T.U.'s

Entitlement denom.type Counterparty I.T.U.'s

Currency type(if applic.): Not applicable

National currency type(if applic.): Not applicable

1.000 Product Step Value: 0.05

Actual

Elemental/compound

Net off difference in the OP's

Market Identifier:Single Market

utilization of the CP's network and the CP's utilization of the OP's network

--

Spot Value

1.000

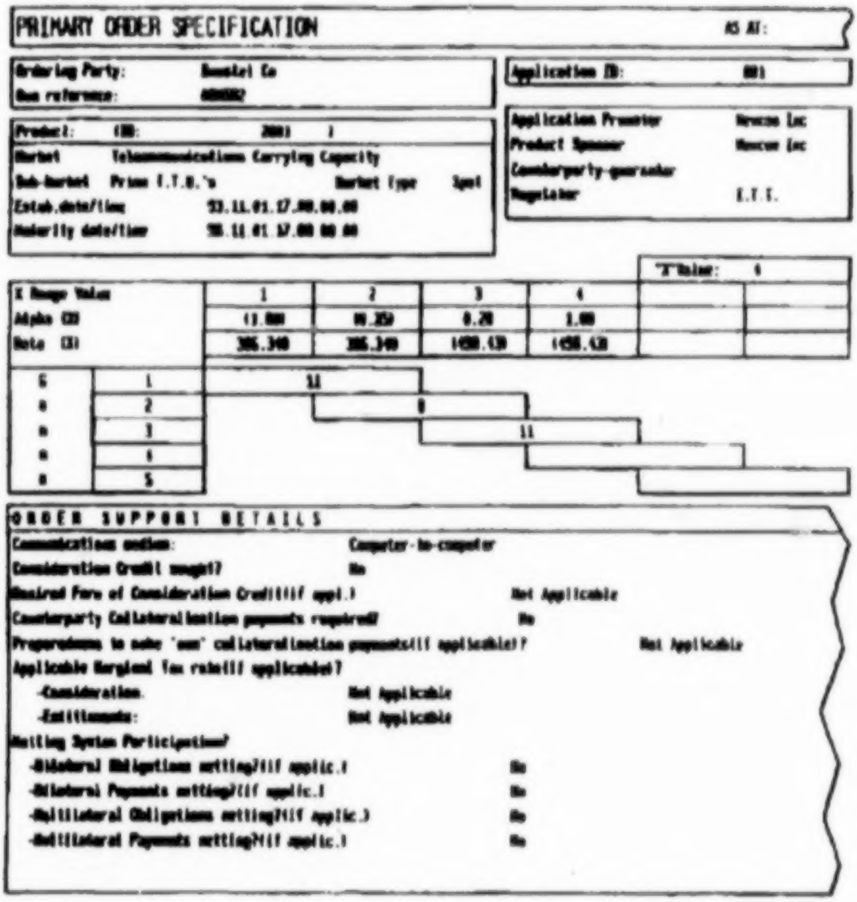
Product Step Value: 0.05

96.11.01.17.00.00.00

Not applicable

National currency type denomination of Product (if applic.) Not applicable

FIG. 53A



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party:	[illegible] Co
Own reference:	[illegible]

Application ID:	001

Product: (ID: 2001)

Market	Telecommunications Carrying Capacity		
Sub-market	Prime [illegible]	Market type	Spot
Estab.date/time	53.11.01.17.00.00.00		
Maturity date/time	55.11.01.17.00.00.00		

Application Promoter	[illegible] Inc
Product Sponsor	[illegible] Inc
Counterparty-guarantor	
Regulator	E.T.I.

"Z" Value: 4

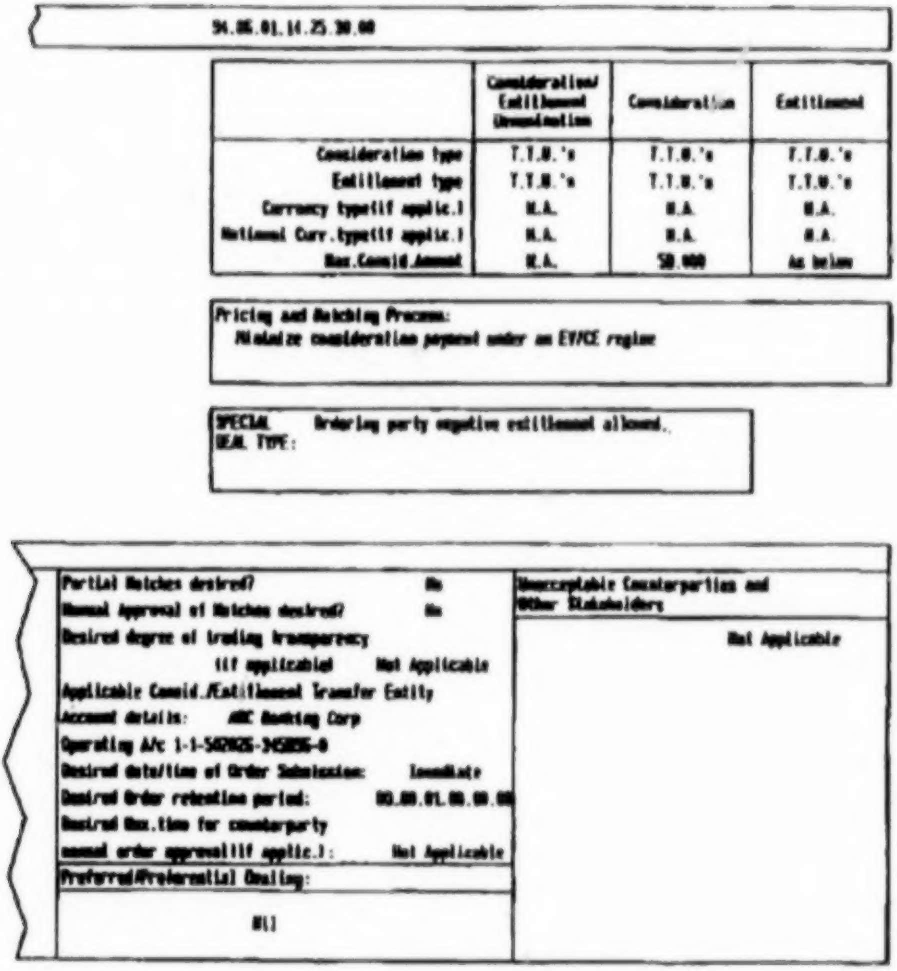
X Range Value	1	2	3	4		
Alpha (2)	(1.00)	(0.25)	0.20	1.00		
Beta (3)	385.340	385.340	(450.43)	(450.43)		

G	1	11					
n	2		0				
n	3			11			
n	4						
n	5						

ORDER SUPPORT DETAILS

Communications medium:	Computer-to-computer
Consideration Credit sought?	No
Desired Form of Consideration Credit(if appl.)	Not Applicable
Counterparty Collateralization payments required?	No
Preparedness to make 'own' collateralization payments(if applicable)?	Not Applicable
Applicable Marginal Tax rate(if applicable)?	
-Consideration.	Not Applicable
-Entitlements:	Not Applicable
Netting System Participation?	
-Bilateral Obligations netting?(if applic.)	No
-Bilateral Payments netting?(if applic.)	No
-Multilateral Obligations netting?(if applic.)	No
-Multilateral Payments netting?(if applic.)	No

FIG. 53B



94.05.01.14.25.30.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Consideration type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if applic.)	N.A.	N.A.	N.A.
Notional Curr.type(if applic.)	N.A.	N.A.	N.A.
Max.Consid.Amount	N.A.	50.000	As below

Pricing and Matching Process:
Minimize consideration payment under an EV/CE regime

SPECIAL DEAL TYPE: Ordering party negative entitlement allowed.

Partial Matches desired? No
Manual Approval of Matches desired? No
Desired degree of trading transparency (if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-502925-345895-0
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty manual order approval(if applic.): Not Applicable

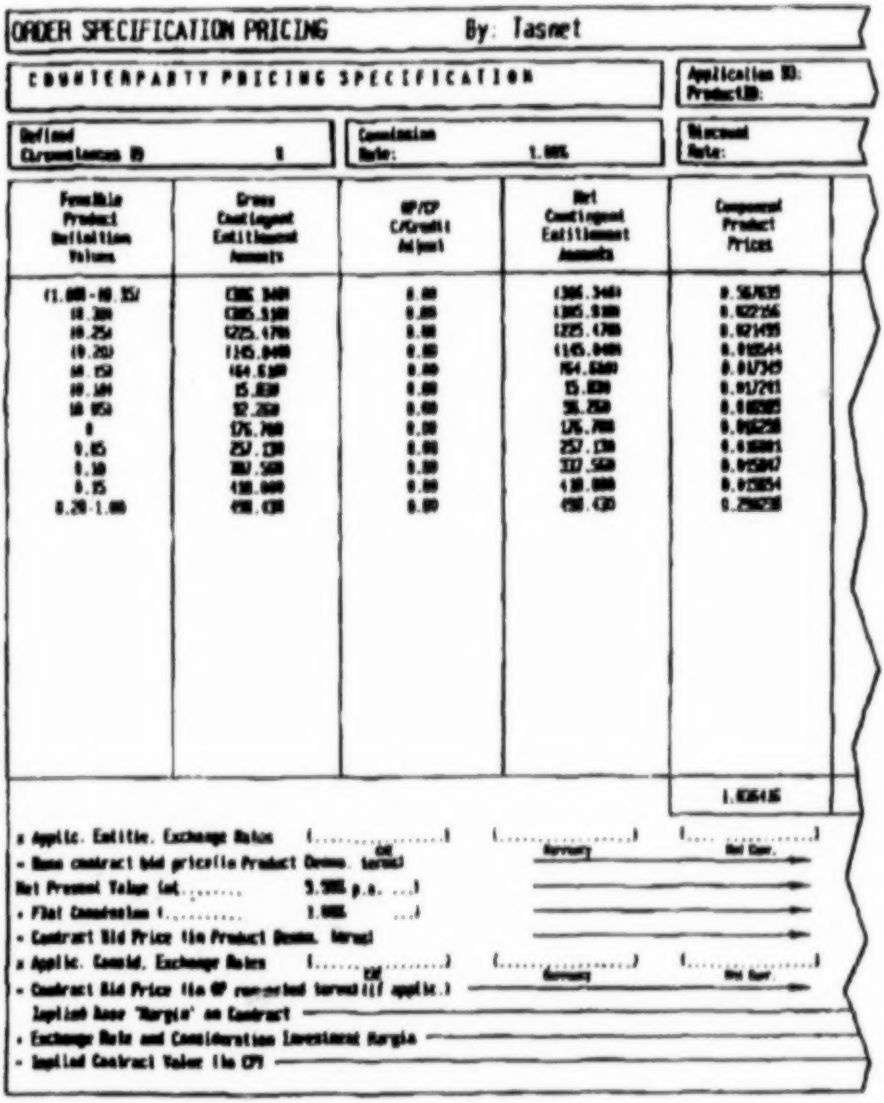
Preferred/Preferential Dealing:

Nil

Unacceptable Counterparties and Other Stakeholders

Not Applicable

FIG. 54A



ORDER SPECIFICATION PRICING By: Tasnet

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID:

Defined Circumstances ID 1

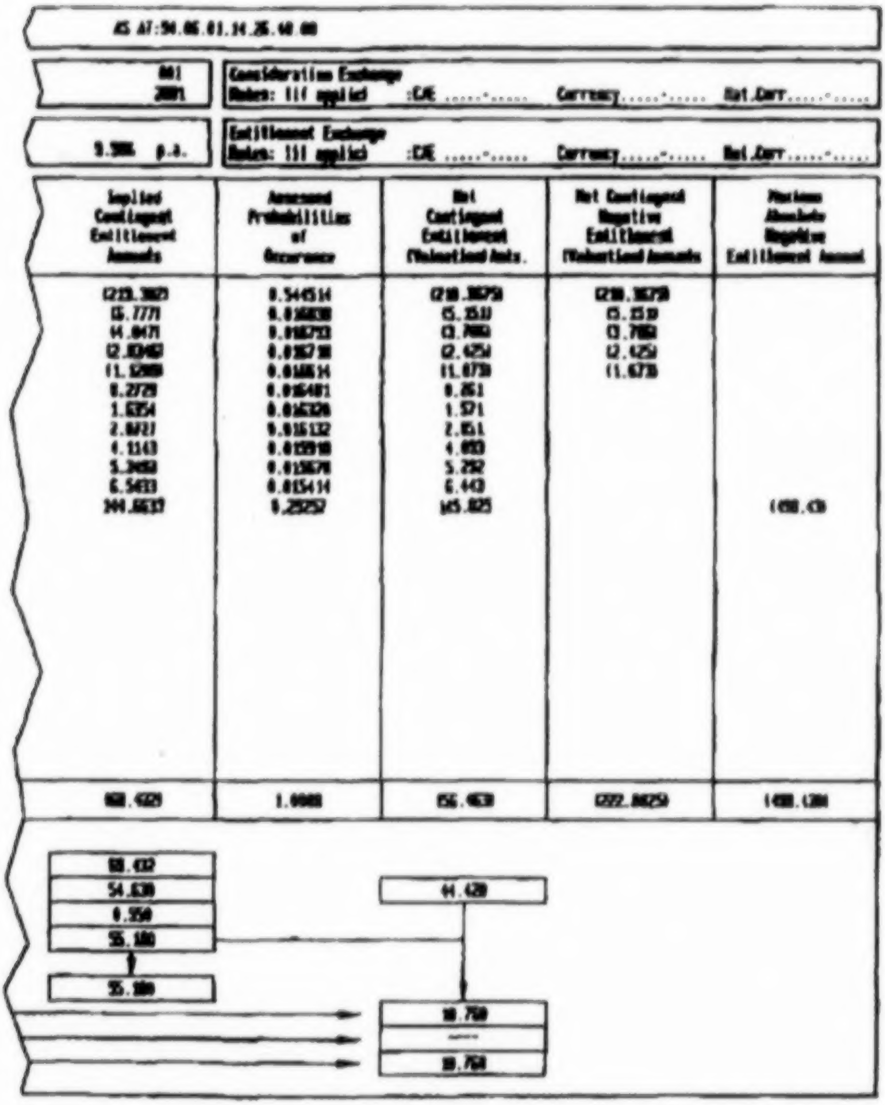
Commission Rate: 1.00%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	OP/CP C/Credit Adjust	Net Contingent Entitlement Amounts	Component Product Prices
(1.00-(0.35)	(305.340)	0.00	(305.340)	0.567635
(0.30)	(305.900)	0.00	(305.900)	0.022156
(0.25)	(225.470)	0.00	(225.470)	0.021495
(0.20)	(145.040)	0.00	(145.040)	0.018544
(0.15)	(64.610)	0.00	(64.610)	0.017345
(0.10)	15.830	0.00	15.830	0.017201
(0.05)	96.260	0.00	96.260	0.016985
0	175.700	0.00	175.700	0.016258
0.05	257.130	0.00	257.130	0.016001
0.10	337.560	0.00	337.560	0.015847
0.15	418.000	0.00	418.000	0.015654
0.20-1.00	498.430	0.00	498.430	0.290230
				1.026416

x Applic. Entitle. Exchange Rates (..........) (..........) (..........)
CHF Currency Ref Cur.
= Base contract bid price(in Product Denom. terms)
Net Present Value (at.......... 5.50% p.a. ...)
+ Flat Commission (.......... 1.00% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (..........) (..........) (..........)
CHF Currency Ref Cur.
= Contract Bid Price (in OP converted terms)(if applic.)
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (in CP)

FIG. 54B

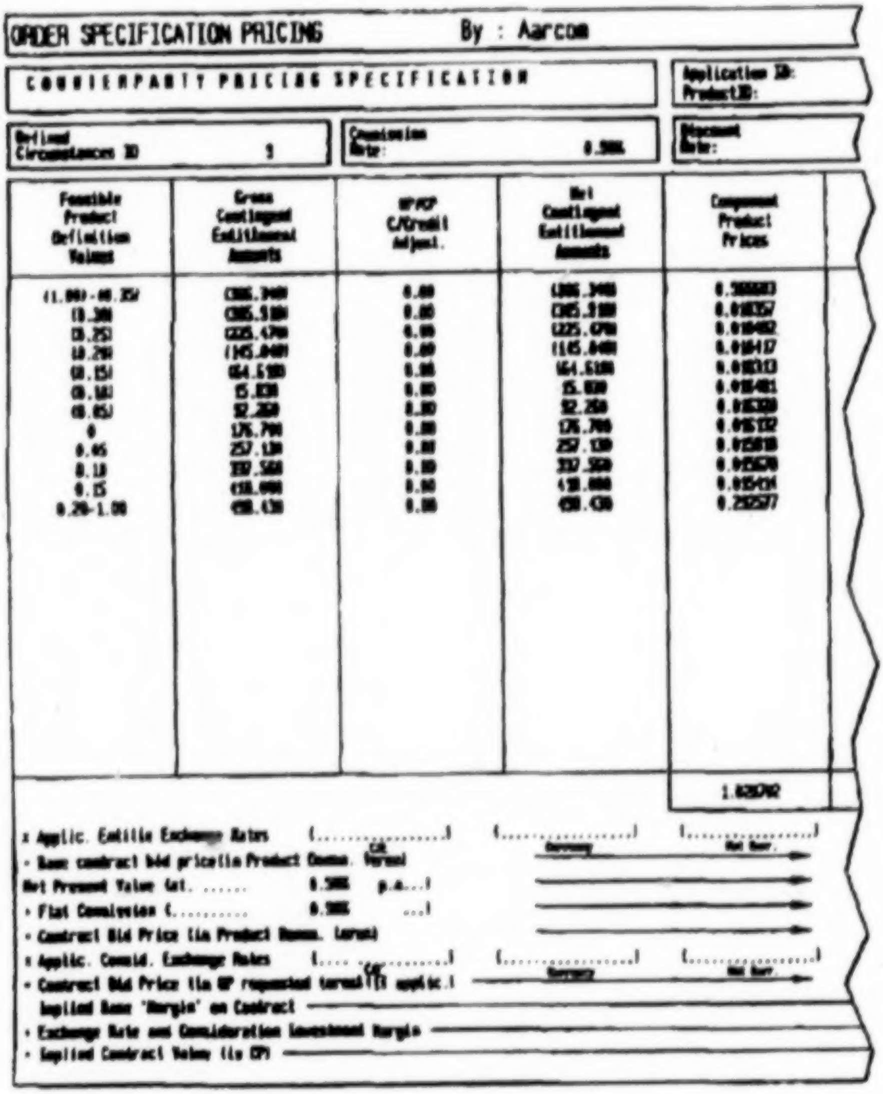


AS AT:30.06.01.14.25.40.00
001
2001
Consideration Exchange
Rates: (if applic) :C/E ......-...... Currency......-...... Ref.Curr......-......
9.30% p.a.
Entitlement Exchange
Rates: (if applic) :C/E ......-...... Currency......-...... Ref.Curr......-......
60.432
54.630
0.550
55.180
55.180
44.420
10.760

10.760

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurrence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(223.3827)	0.544514	(218.3575)	(218.3575)	
(5.7771)	0.016830	(5.1513)	(5.1513)	
(4.0471)	0.016753	(3.7060)	(3.7060)	
(2.8348)	0.016738	(2.4254)	(2.4254)	
(1.5288)	0.016614	(1.6730)	(1.6730)	
0.2729	0.016481	0.251		
1.6354	0.016326	1.571		
2.8727	0.016132	2.851		
4.1143	0.015910	4.093		
5.3458	0.015670	5.292		
6.5433	0.015414	6.443		
344.6637	0.25257	165.825		(498.43)
60.4325	1.0000	(56.463)	(222.8825)	(498.420)

FIG. 55A



ORDER SPECIFICATION PRICING By : Aarcom

COUNTERPARTY PRICING SPECIFICATION

Application ID:
ProductID:

Defined Circumstances ID 1

Commission Rate: 0.50%

Discount Rate:

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	OP/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
(1.00)-(0.35)	(385.340)	0.00	(385.340)	0.366683
(0.30)	(385.510)	0.00	(385.310)	0.010357
(0.25)	(225.470)	0.00	(225.470)	0.010402
(0.20)	(145.040)	0.00	(145.040)	0.010417
(0.15)	(64.510)	0.00	(64.510)	0.010313
(0.10)	15.030	0.00	15.030	0.010481
(0.05)	92.250	0.00	92.250	0.010330
0	176.700	0.00	176.700	0.010132
0.05	257.130	0.00	257.130	0.010810
0.10	337.560	0.00	337.560	0.010670
0.15	418.000	0.00	418.000	0.010434
0.20-1.00	498.430	0.00	498.430	0.232577
				1.020702

x Applic. Entitle Exchange Rates (..................) (..................) (..................)

= Base contract bid price (in Product Denom. Terms) CCR Currency Net Curr.

Net Present Value (at. ...... 0.50% p.a...)

+ Flat Commission (.......... 0.50% ...)

= Contract Bid Price (in Product Denom. Terms)

x Applic. Consid. Exchange Rates (..................) (..................) (..................)

= Contract Bid Price (in CP requested terms) (if applic.) CCY Currency Net Curr.

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

= Implied Contract Value (in CP)

FIG. 55B

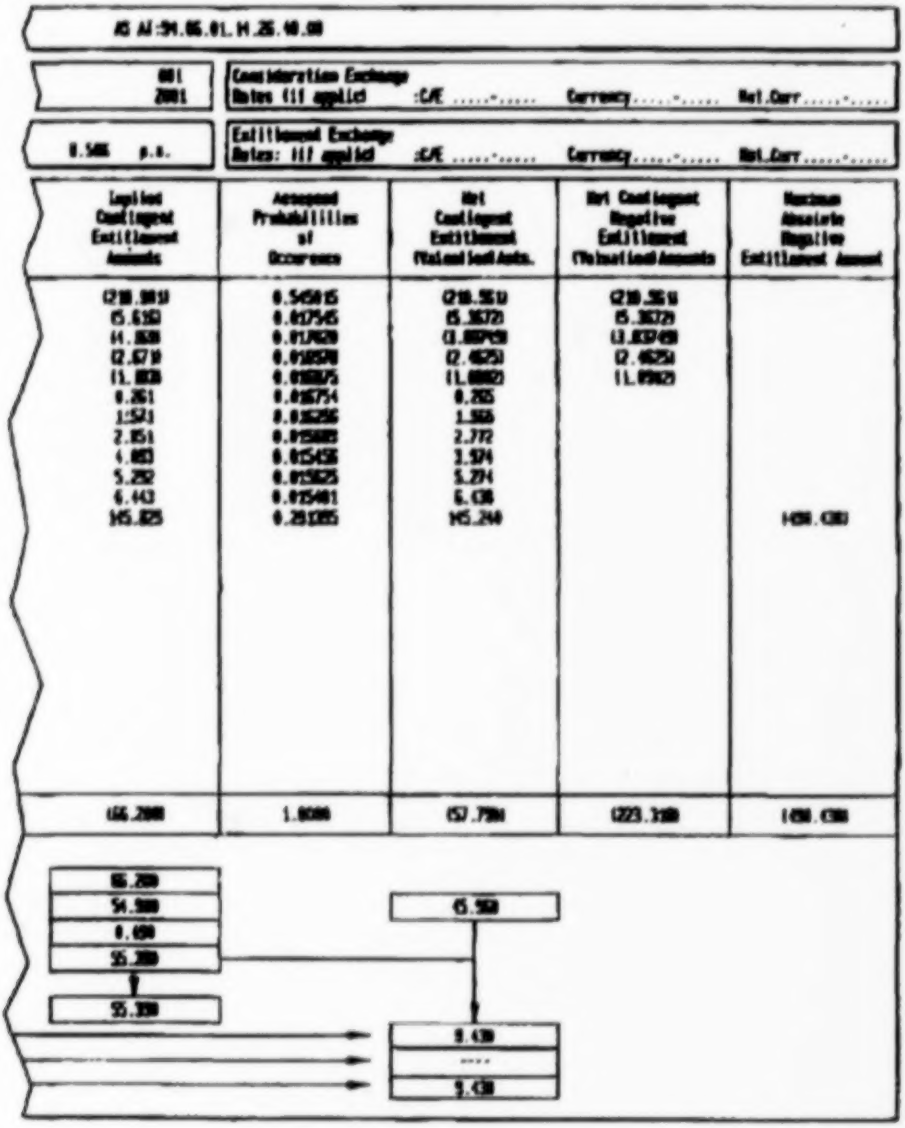
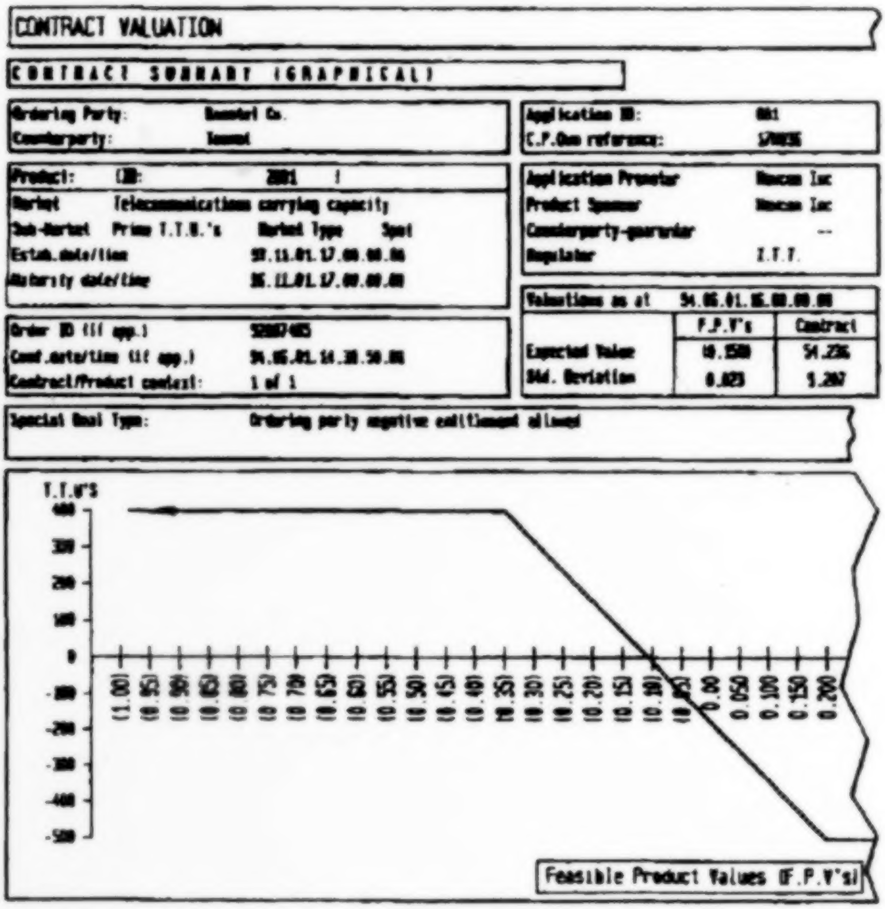

Consideration Exchange
Rates (if applied) :C/E Currency Ref.Curr
Entitlement Exchange
Rates: (if applied) :C/E Currency Ref.Curr
Implied Contingent Entitlement Amounts
Assessed Probabilities of Occurrence
Net Contingent Entitlement (Valuation) Amts.
Net Contingent Negative Entitlement (Valuation) Amounts
Maximum Absolute Negative Entitlement Amount

FIG. 56A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: [illegible] Co.
Counterparty: [illegible]

Product: (ID: 2001)
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab. date/time 97.11.01.17.00.00.00
Maturity date/time 06.11.01.17.00.00.00

Order ID (if app.) 52007485
Conf. date/time (if app.) 04.05.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 001
C.P.Own reference: [illegible]

Application Promoter [illegible] Inc
Product Sponsor [illegible] Inc
Counterparty-guarantor --
Regulator I.T.T.

Valuations as at 04.05.01.15.00.00.00

	F.P.V's	Contract
Expected Value	10.150	54.236
Std. Deviation	0.023	5.207

Special Deal Type: Ordering party negative entitlement allowed

T.T.U'S
400
300
200
100
0
-100
-200
-300
-400
-500
(1.00)
(0.95)
(0.90)
(0.85)
(0.80)
(0.75)
(0.70)
(0.65)
(0.60)
(0.55)
(0.50)
(0.45)
(0.40)
(0.35)
(0.30)
(0.25)
(0.20)
(0.15)
(0.10)
(0.05)
0.00
0.050
0.100
0.150
0.200
Feasible Product Values (F.P.V's)

FIG. 56B

AS AT 94.05.01.16.00.00.00 Report for: Banctel Co.

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,100	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

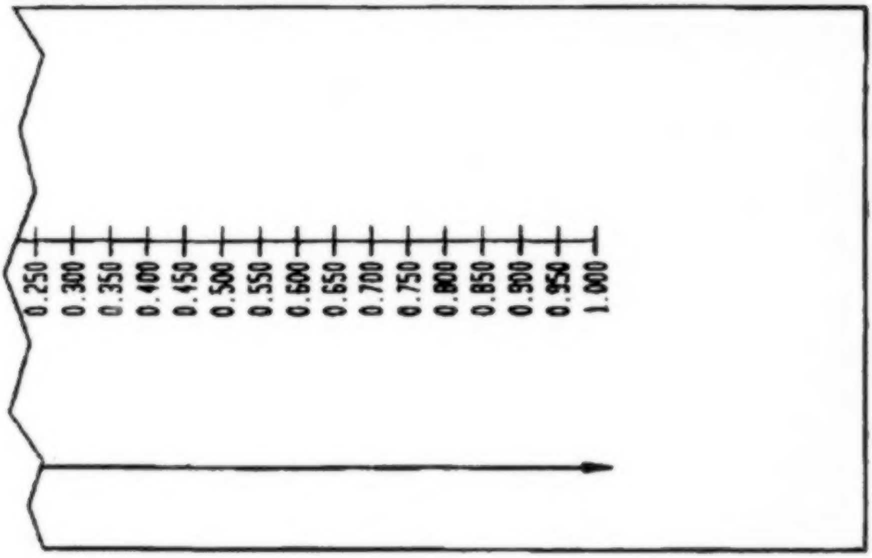
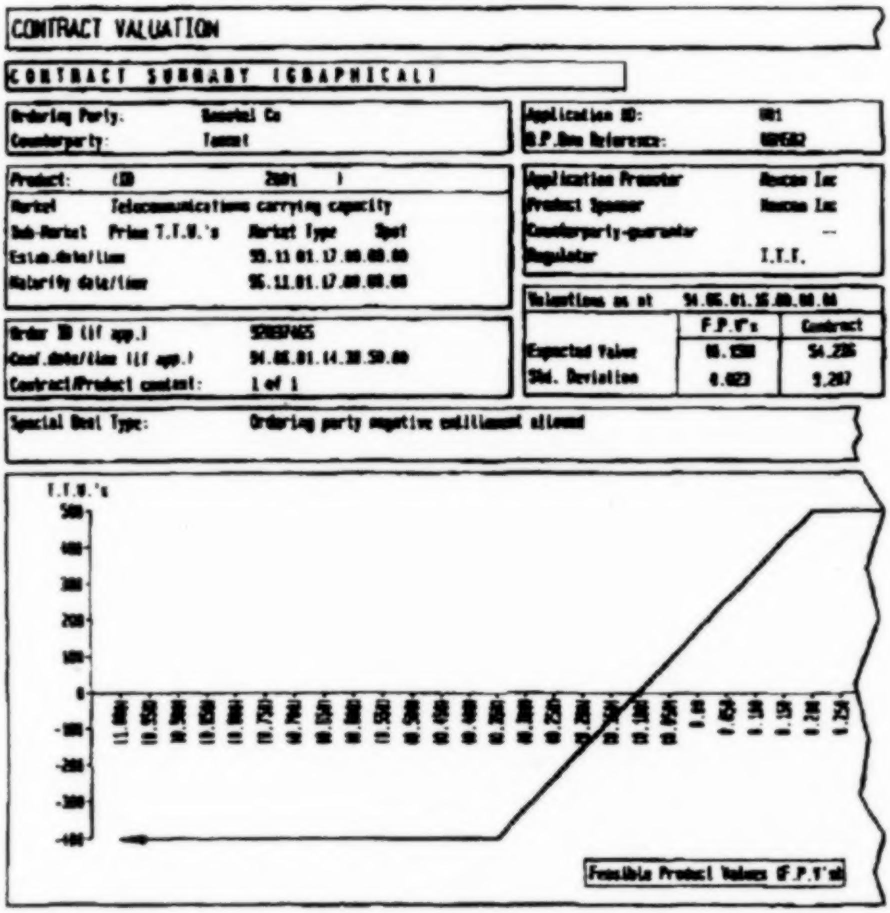


FIG. 57A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Sanotel Co
Counterparty: [illegible]

Application ID: 001
B.P.Doc Reference: 009582

Product: (ID 2001)
Market Telecommunications carrying capacity
Sub-Market Prime T.T.U.'s Market Type Spot
Estab.date/time 93.11.01.17.00.00.00
Maturity date/time 95.11.01.17.00.00.00

Application Promoter [illegible] Inc
Product Sponsor [illegible] Inc
Counterparty-guarantor --
Regulator I.T.F.

Order ID (if app.) 52083465
Conf.date/time (if app.) 94.05.01.14.30.50.00
Contract/Product content: 1 of 1

Valuations as at 94.05.01.15.00.00.00

	F.P.V's	Contract
Expected Value	10.150	54.236
Std. Deviation	0.023	9.207

Special Deal Type: Ordering party negative entitlement allowed

FIG. 57B

AS AT 94.06.01.16.00.00.00 Report for: Tannet

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr. type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,100	As below

Pricing and Matching Process: Minimize consideration payment
under an EY/CE regime

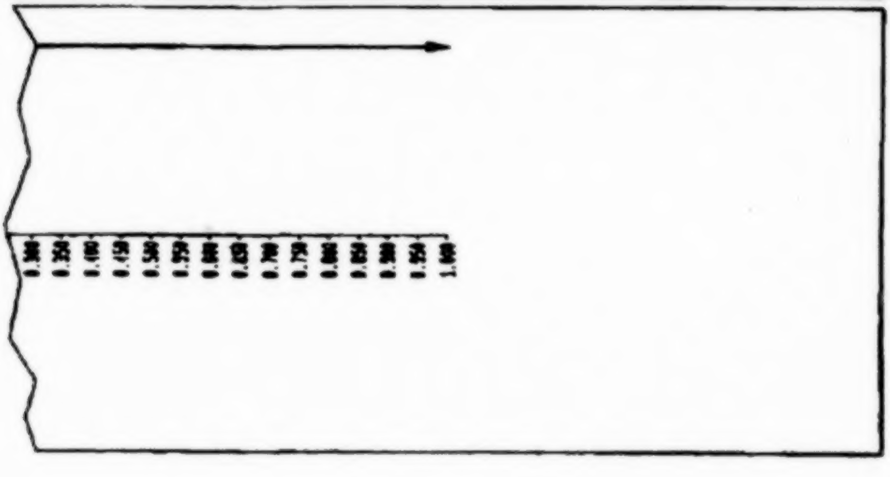
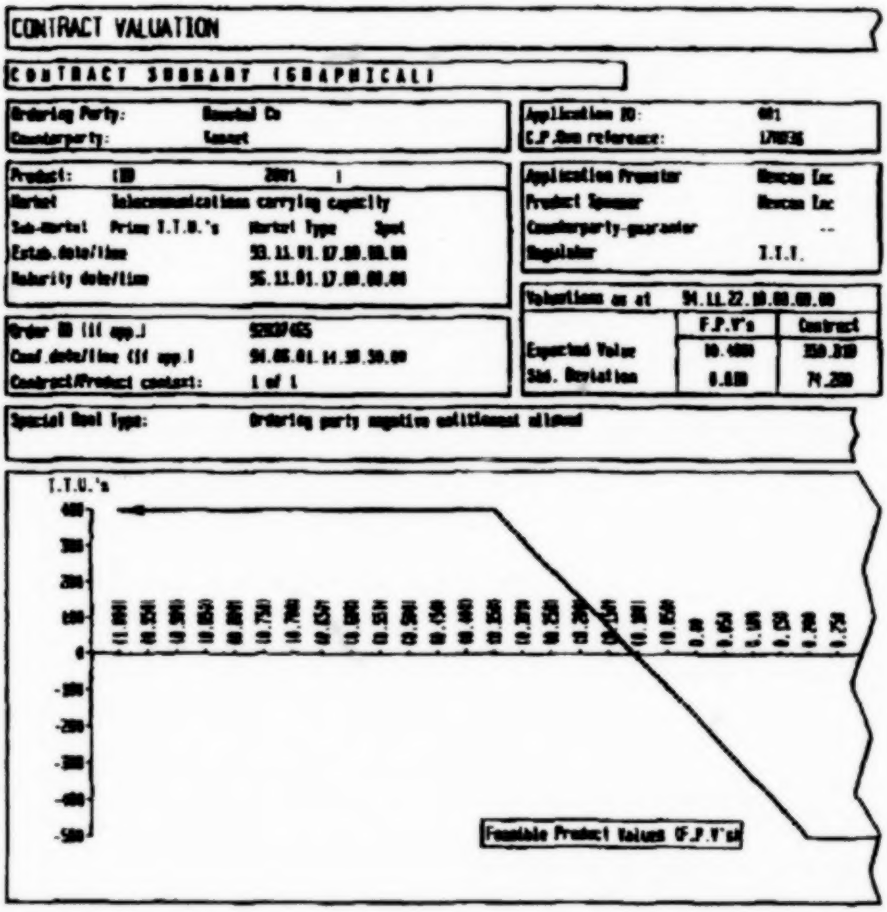


FIG. 58A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Bounded Co
Counterparty:	Lessor

Product:	(ID	2001	1
Market	Telecommunications carrying capacity		
Sub-Market	Prime T.T.U.'s	Market Type	Spot
Estab. date/time		93.11.01.17.00.00.00	
Maturity date/time		95.11.01.17.00.00.00	

Order ID (if app.)	92037465
Conf. date/time (if app.)	94.05.01.14.30.30.00
Contract/Product context:	1 of 1

Application ID:	001
C.P.Dom reference:	170836

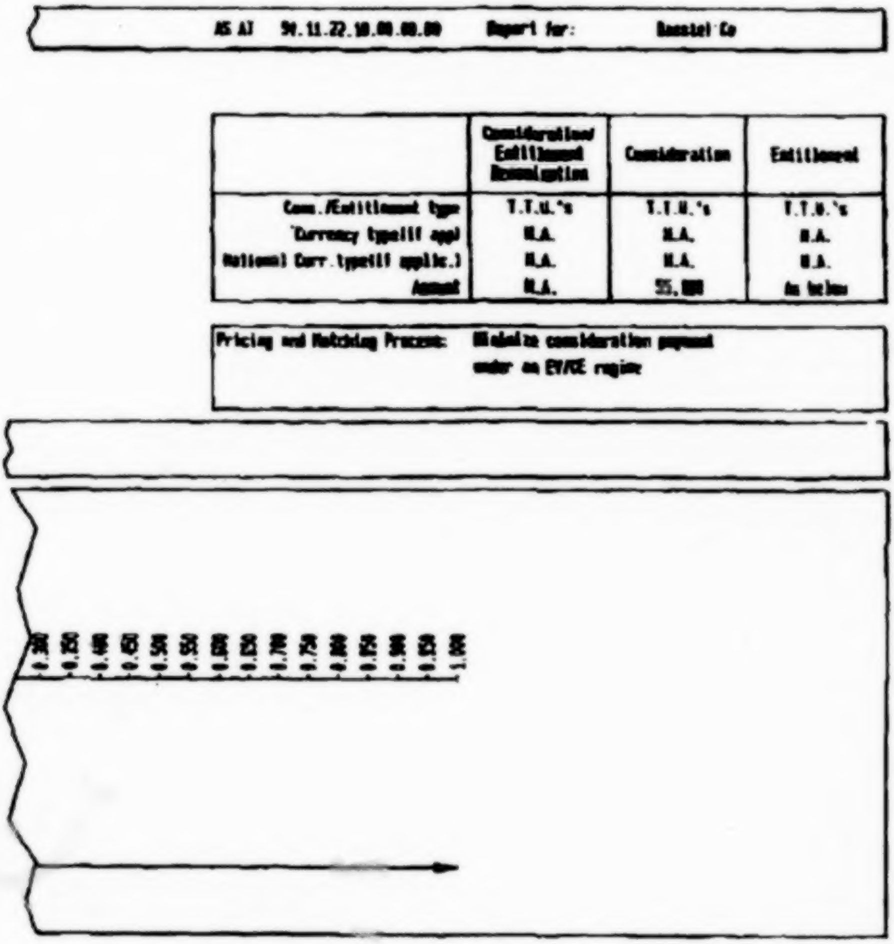
Application Promoter	Rescom Inc
Product Sponsor	Rescom Inc
Counterparty-guarantor	--
Regulator	T.T.I.

Valuations as at 94.11.22.10.00.00.00

	F.P.V's	Contract
Expected Value	10.4000	350.310
Std. Deviation	0.000	74.200

Special Deal Type: Ordering party negative entitlement allowed

FIG. 58B



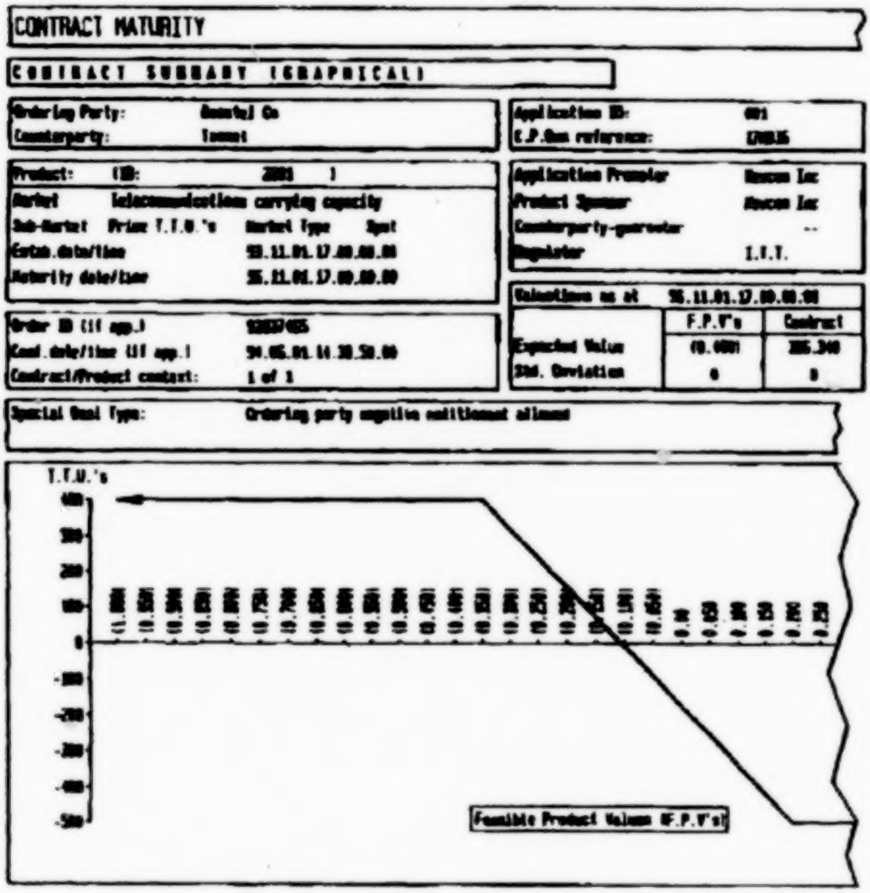
AS AT 94.11.22.10.00.00.00 Report for: Bonsiel Co

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
National Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,000	As below

Pricing and Matching Process: Minimize consideration payment under an EV/CE regime

0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 59A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Gamtel Co
Counterparty: Tomnet

Product: (ID: 2001)
Market: Telecommunications carrying capacity
Sub-Market: Prime T.T.U.'s Market Type: Spot
Estab. date/time 93.11.01.17.00.00.00
Maturity date/time 95.11.01.17.00.00.00

Order ID (if app.) 93037465
Cont. date/time (if app.) 94.05.01.14.30.50.00
Contract/Product context: 1 of 1

Application ID: 001
C.P.Dom reference: 170815

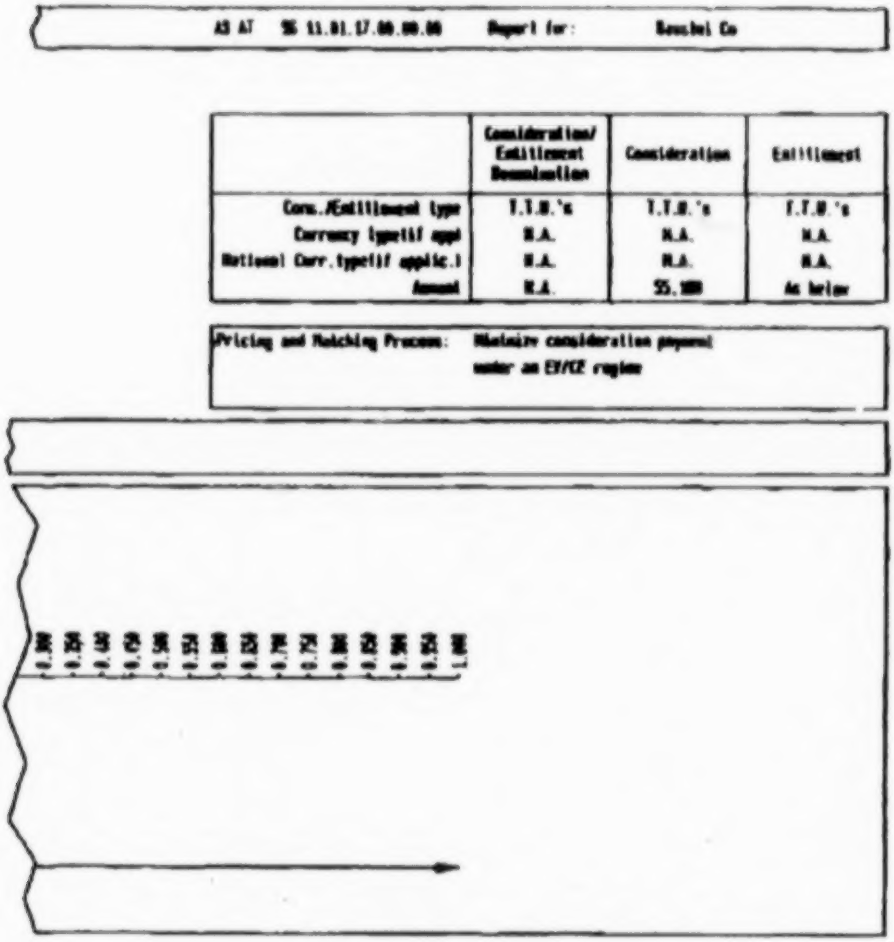
Application Promoter Avocon Inc
Product Sponsor Avocon Inc
Counterparty-guarantor --
Regulator I.T.T.

Valuations as at 95.11.01.17.00.00.00

	F.P.V's	Contract
Expected Value	(0.400)	285.340
Std. Deviation	0	0

Special Deal Type: Ordering party negative entitlement allowed

FIG. 59B



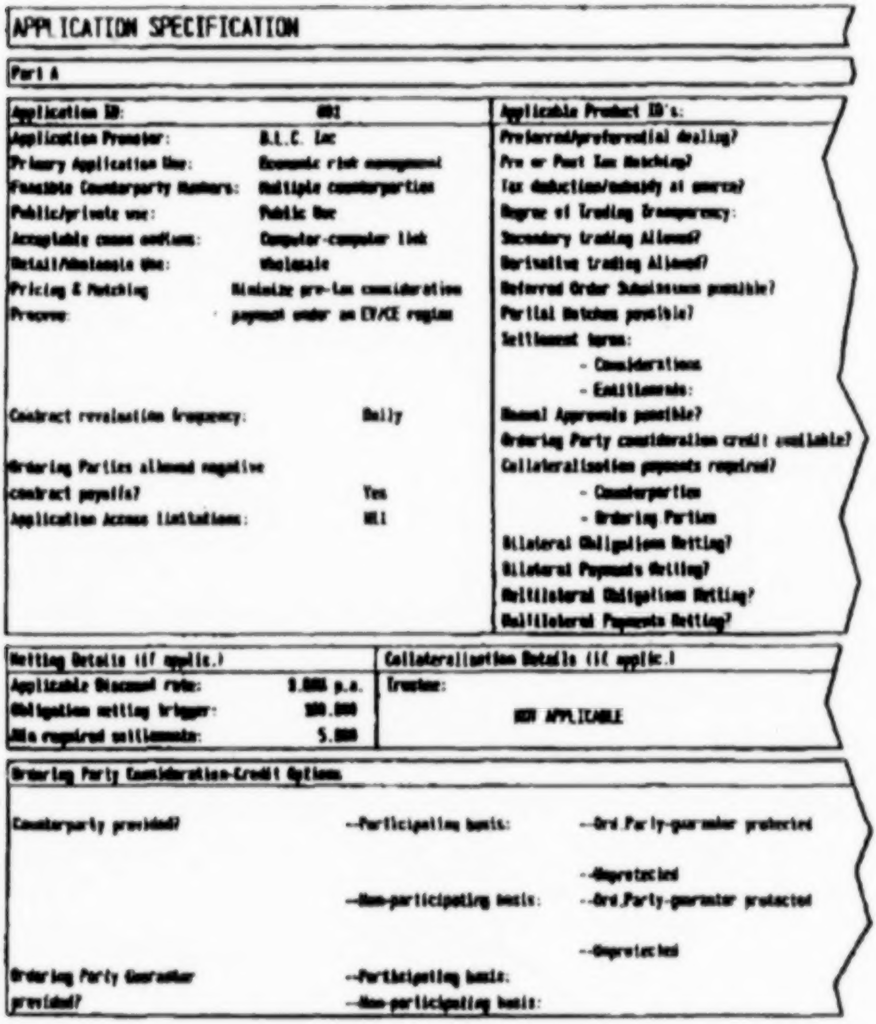
AS AT SS 11.01.17.00.00.00 Report for: Seashel Co

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	T.T.U.'s	T.T.U.'s	T.T.U.'s
Currency type(if appl	N.A.	N.A.	N.A.
Notional Curr.type(if applic.)	N.A.	N.A.	N.A.
Amount	N.A.	55,100	As below

Pricing and Matching Process: Maximize consideration payment under an EF/CE regime

0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000

FIG. 60A



APPLICATION SPECIFICATION

Part A

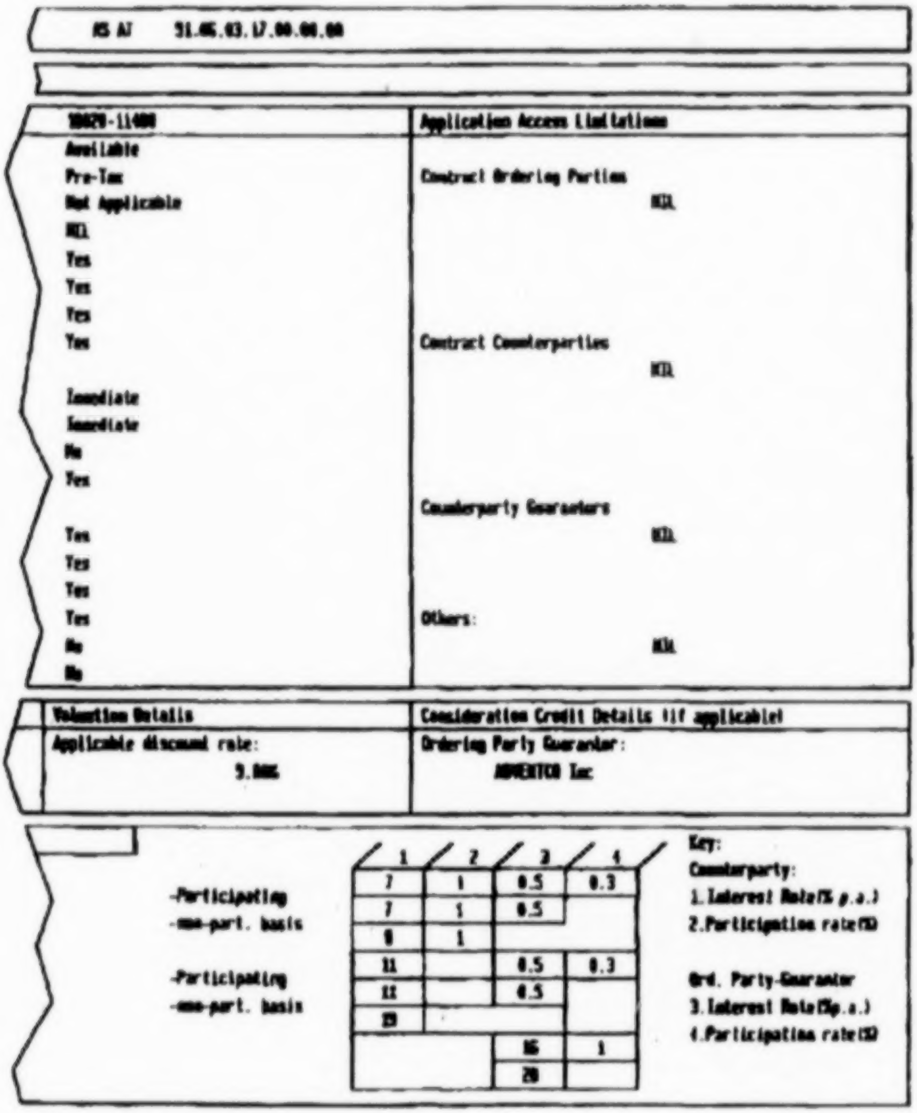
Application ID:	001	Applicable Product ID's:
Application Promoter:	B.L.C. Inc	Preferred/preferential dealing?
Primary Application Use:	Economic risk management	Pre or Post Tax Matching?
Feasible Counterparty Numbers:	Multiple counterparties	Tax deduction/subsidy at source?
Public/private use:	Public Use	Degree of Trading Transparency:
Acceptable communications:	Computer-computer link	Secondary trading Allowed?
Retail/Wholesale Use:	Wholesale	Derivative trading Allowed?
Pricing & Matching	Minimize pre-tax consideration	Deferred Order Submissions possible?
Process:	payment under an ET/CE regime	Partial Matches possible?
		Settlement terms:
		- Considerations
		- Entitlements:
Contract revaluation frequency:	Daily	Manual Approvals possible?
		Ordering Party consideration credit available?
Ordering Parties allowed negative		Collateralisation payments required?
contract payoffs?	Yes	- Counterparties
Application Access limitations:	NIL	- Ordering Parties
		Bilateral Obligations Netting?
		Bilateral Payments Netting?
		Multilateral Obligations Netting?
		Multilateral Payments Netting?

Netting Details (if applic.)		Collateralisation Details (if applic.)
Applicable Discount rate:	3.00% p.a.	Trustee:
Obligation netting trigger:	100.000	NOT APPLICABLE
Min required settlements:	5.000	

Ordering Party Consideration-Credit Options

Counterparty provided?	--Participating basis:	--Ord.Party-guarantor protected
		--Unprotected
	--Non-participating basis:	--Ord.Party-guarantor protected
		--Unprotected
Ordering Party Guarantor provided?	--Participating basis:	
	--Non-participating basis:	

FIG. 60B



AS AT 31.05.03.17.00.00.00

10020-11400	Application Access Limitations
Available Pre-Tax Not Applicable NIL Yes Yes Yes Yes Immediate Immediate No Yes Yes Yes Yes Yes No No	Contract Ordering Parties NIL Contract Counterparties NIL Counterparty Guarantors NIL Others: NIL
Valuation Details	Consideration Credit Details (if applicable)
Applicable discount rate: 5.00%	Ordering Party Guarantor: ADVENTCO Inc

-Participating
-non-part. basis

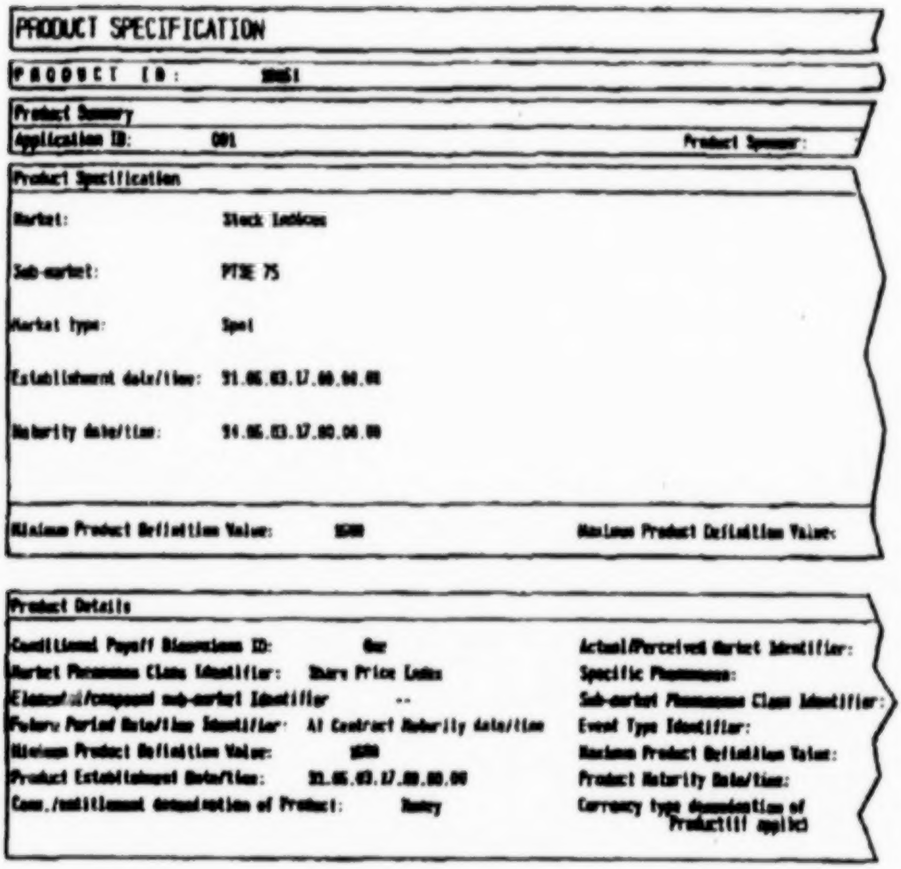
-Participating
-non-part. basis

1	2	3	4
7	1	0.5	0.3
7	1	0.5	
9	1		
11		0.5	0.3
12		0.5	
19			
		16	1
		20	

Key:
Counterparty:
1. Interest Rate(% p.a.)
2. Participation rate(%)

Ord. Party-Guarantor
3. Interest Rate(%p.a.)
4. Participation rate(%)

FIG. 61A



PRODUCT SPECIFICATION

PRODUCT ID: 10051

Product Summary

Application ID: 001

Product Sponsor:

Product Specification

Market: Stock Indices

Sub-market: FTSE 75

Market type: Spot

Establishment date/time: 31.06.03.17.00.00.00

Maturity date/time: 34.06.03.17.00.00.00

Minimum Product Definition Value: 1500

Maximum Product Definition Value:

Product Details

Conditional Payoff Dimensions ID: One

Market Phenomenon Class Identifier: Share Price Index

Elemental/compound sub-market Identifier --

Future Period Date/time Identifier: At Contract Maturity date/time

Minimum Product Definition Value: 1500

Product Establishment Date/time: 31.06.03.17.00.00.00

Cons./entitlement denomination of Product: Money

Actual/Perceived Market Identifier:

Specific Phenomenon:

Sub-market Phenomenon Class Identifier:

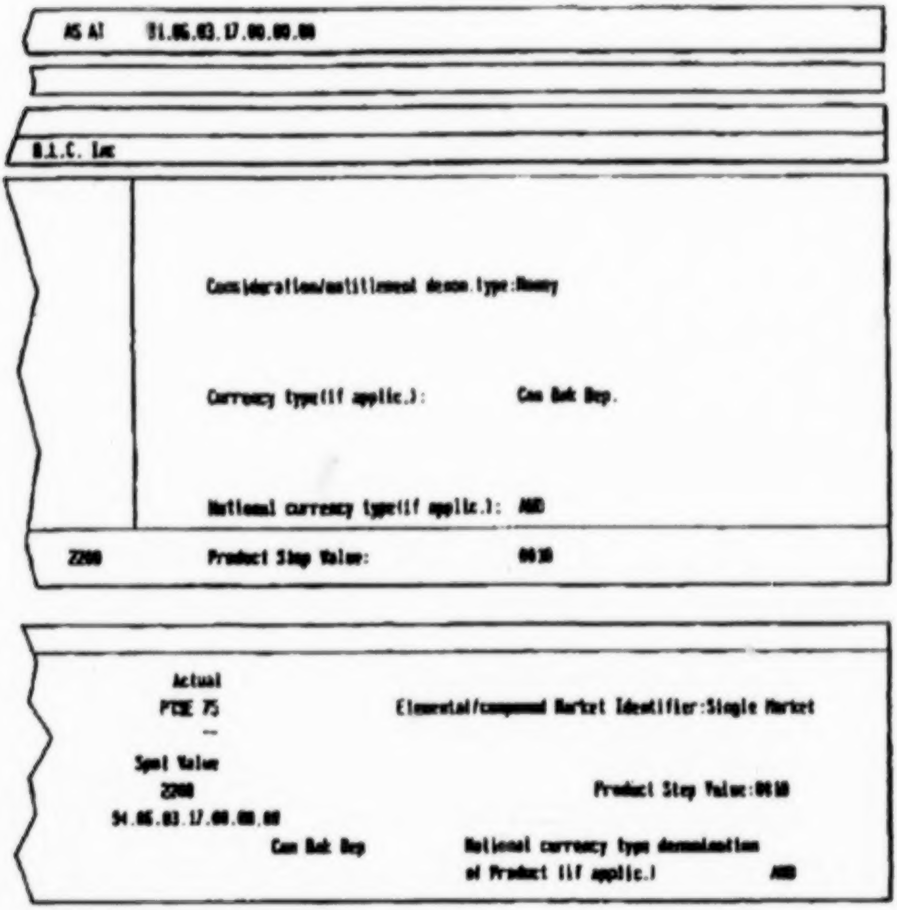
Event Type Identifier:

Maximum Product Definition Value:

Product Maturity Date/time:

Currency type denomination of Product(if applic)

FIG. 61B



AS AT 94.06.03.17.00.00.00

B.I.C. Inc

Consideration/entitlement denom. type:Money

Currency type(if applic.): Can Bnk Dep.

National currency type(if applic.): AUD

2200 Product Step Value: 0010

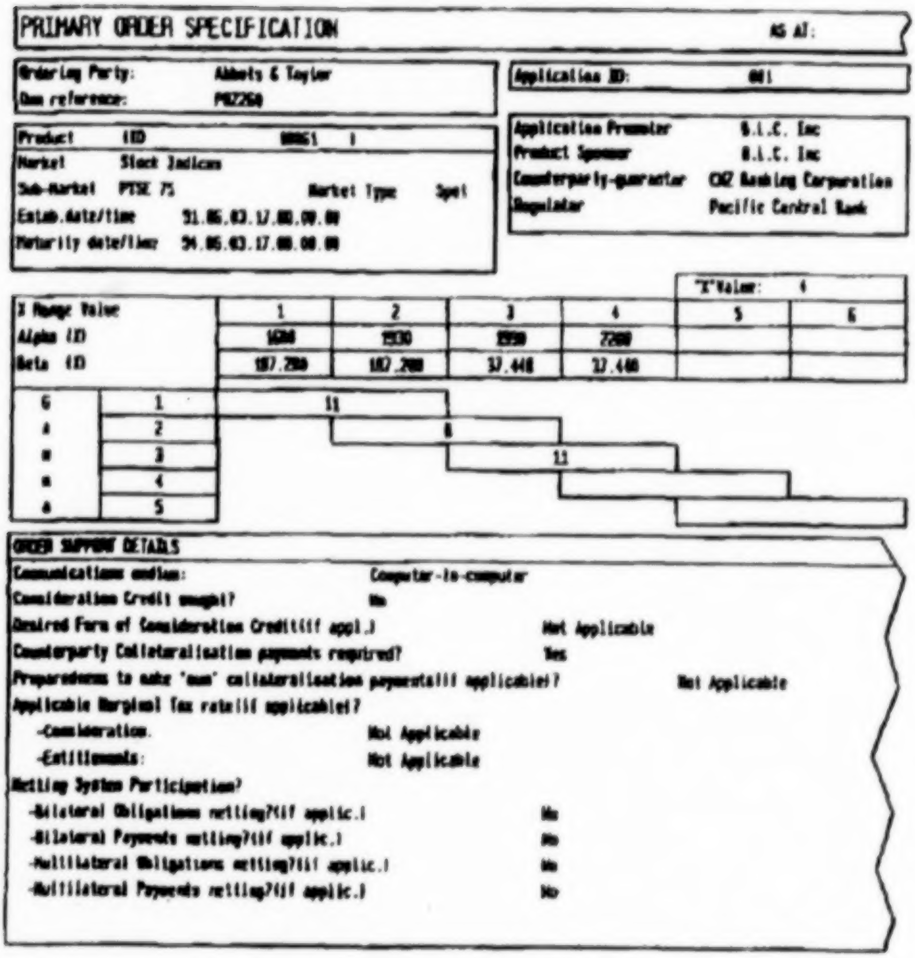
Actual
PCSE 75
--
Spot Value
2200
94.06.03.17.00.00.00
Can Bnk Dep

Elemental/compound Market Identifier:Single Market

Product Step Value:0010

National currency type denomination of Product (if applic.) AUD

FIG. 62A



PRIMARY ORDER SPECIFICATION AS AT:

Ordering Party: Abbots & Taylor
Own reference: P02260

Application ID: 001

Product ID 00051 1
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab.date/time 31.05.03.17.00.00.00
Maturity date/time 34.05.03.17.00.00.00

Application Promoter B.I.C. Inc
Product Sponsor B.I.C. Inc
Counterparty-guarantor CXZ Banking Corporation
Regulator Pacific Central Bank

"X" Value: 4

X Range Value	1	2	3	4	5	6
Alpha (X)	1600	1930	1990	2200		
Beta (X)	187.200	187.200	37.440	37.440		

ORDER SUPPORT DETAILS
Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? Yes
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration. Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 62B

53.01.01.17.37.06.00

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	54,000	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an EVACE regime

SPECIAL DEAL TYPE: Collateralisation Payments

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading
Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-582026-618830-4
Desired date/time of Order Submission: Immediate
Desired Order retention period: 00.00.01.00.00.00
Desired Max.time for counterparty
manual order approval(if applic.): Not Applicable

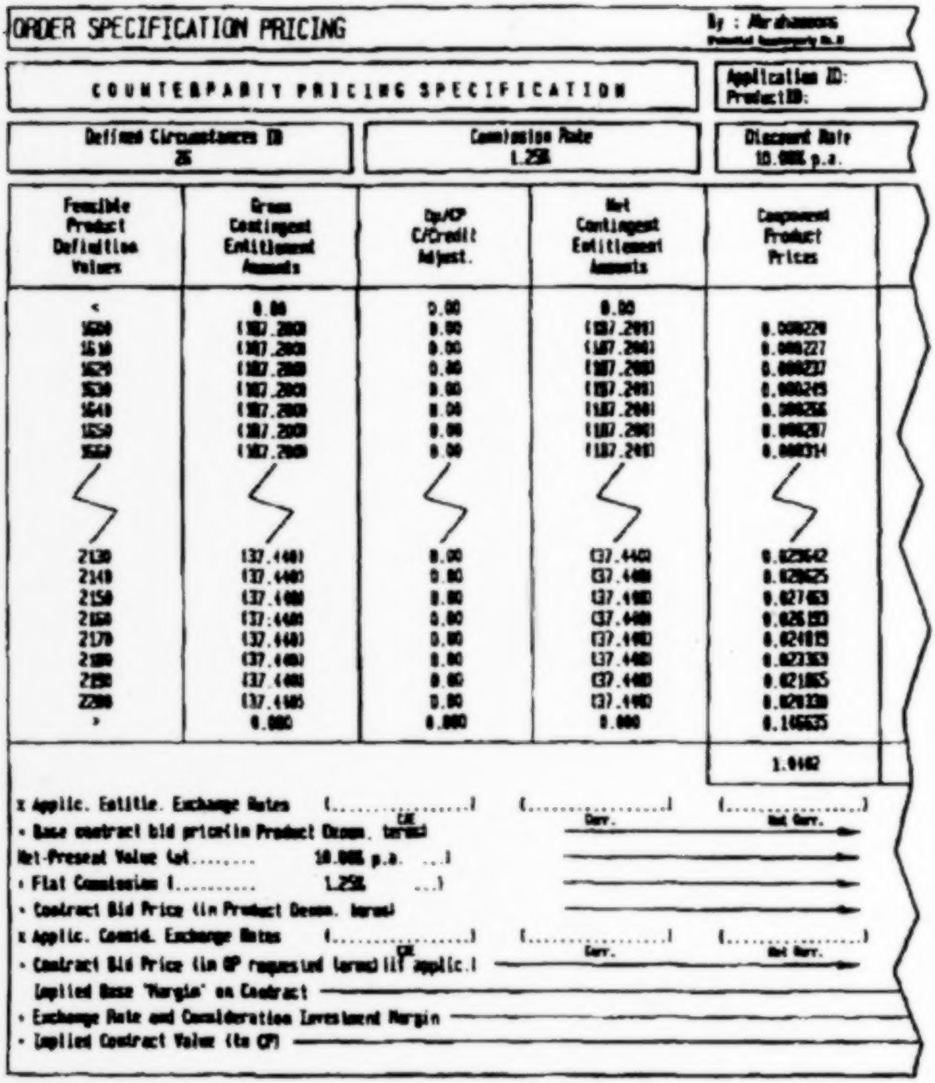
Preferred/Preferential Dealing:

NIL

Unacceptable Counterparties and Other Stakeholders

NIL

FIG. 63A



ORDER SPECIFICATION PRICING

By : Abrahamsons
[illegible]

COUNTERPARTY PRICING SPECIFICATION

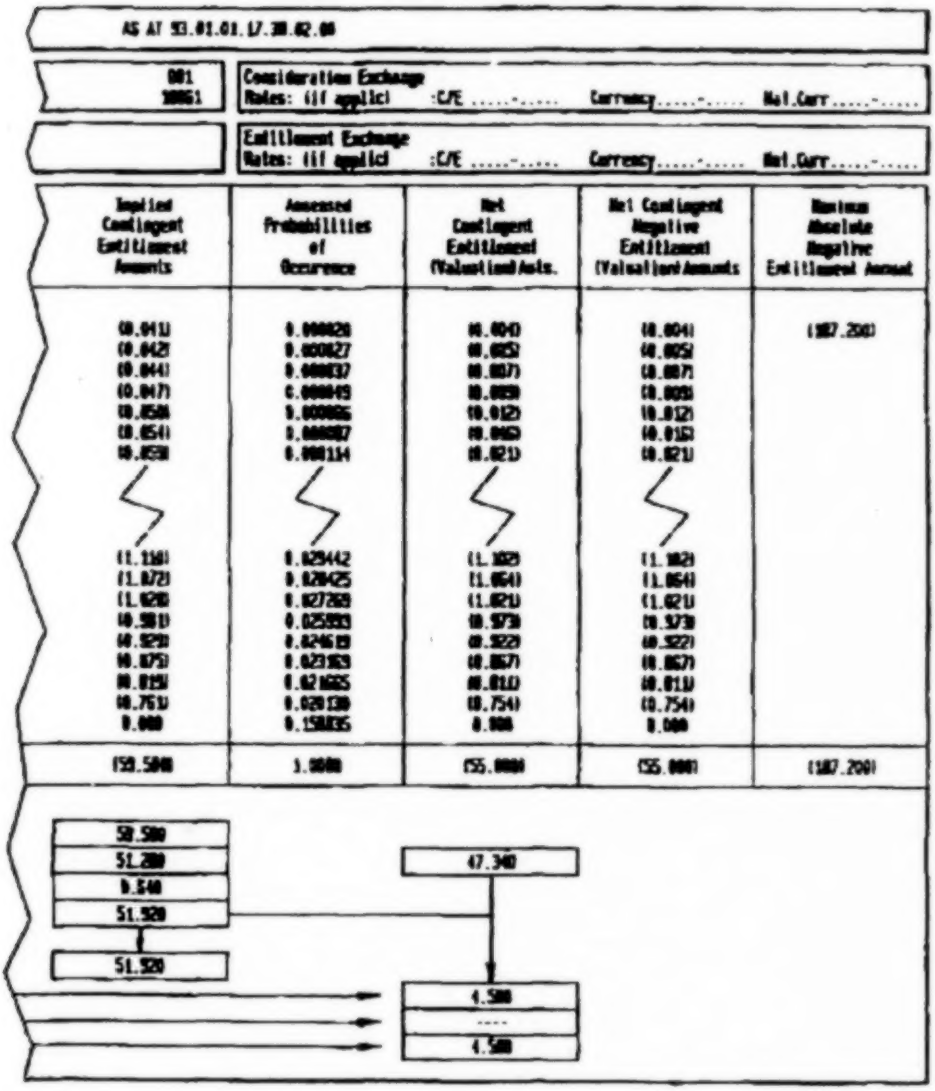
Application ID:
Product ID:

Defined Circumstances ID	Commission Rate	Discount Rate
26	1.25%	10.00% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Op/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
<	0.00	0.00	0.00	
1600	(187.2000)	0.00	(187.2000)	0.000220
1610	(187.2000)	0.00	(187.2000)	0.000227
1620	(187.2000)	0.00	(187.2000)	0.000237
1630	(187.2000)	0.00	(187.2000)	0.000245
1640	(187.2000)	0.00	(187.2000)	0.000256
1650	(187.2000)	0.00	(187.2000)	0.000267
1660	(187.2000)	0.00	(187.2000)	0.000314
2130	(37.4400)	0.00	(37.4400)	0.029642
2140	(37.4400)	0.00	(37.4400)	0.028625
2150	(37.4400)	0.00	(37.4400)	0.027463
2160	(37:4400)	0.00	(37.4400)	0.026180
2170	(37.4400)	0.00	(37.4400)	0.024819
2180	(37.4400)	0.00	(37.4400)	0.023363
2190	(37.4400)	0.00	(37.4400)	0.021865
2200	(37.4400)	0.00	(37.4400)	0.020330
>	0.000	0.000	0.000	0.146635
				1.0402

x Applic. Entitle. Exchange Rates (..................) (..................) (..................)
CUE Curr. Nat Curr.
= Base contract bid price (in Product Denom. terms)
Net-Present Value (at........ 10.00% p.a. ...)
+ Flat Commission (.......... 1.25% ...)
= Contract Bid Price (in Product Denom. terms)
x Applic. Consid. Exchange Rates (..................) (..................) (..................)
CUE Curr. Nat Curr.
= Contract Bid Price (in OP requested terms) (if applic.)
Implied Base 'Margin' on Contract
+ Exchange Rate and Consideration Investment Margin
= Implied Contract Value (to CP)

FIG. 63B



AS AT 93.01.01.17.30.02.00

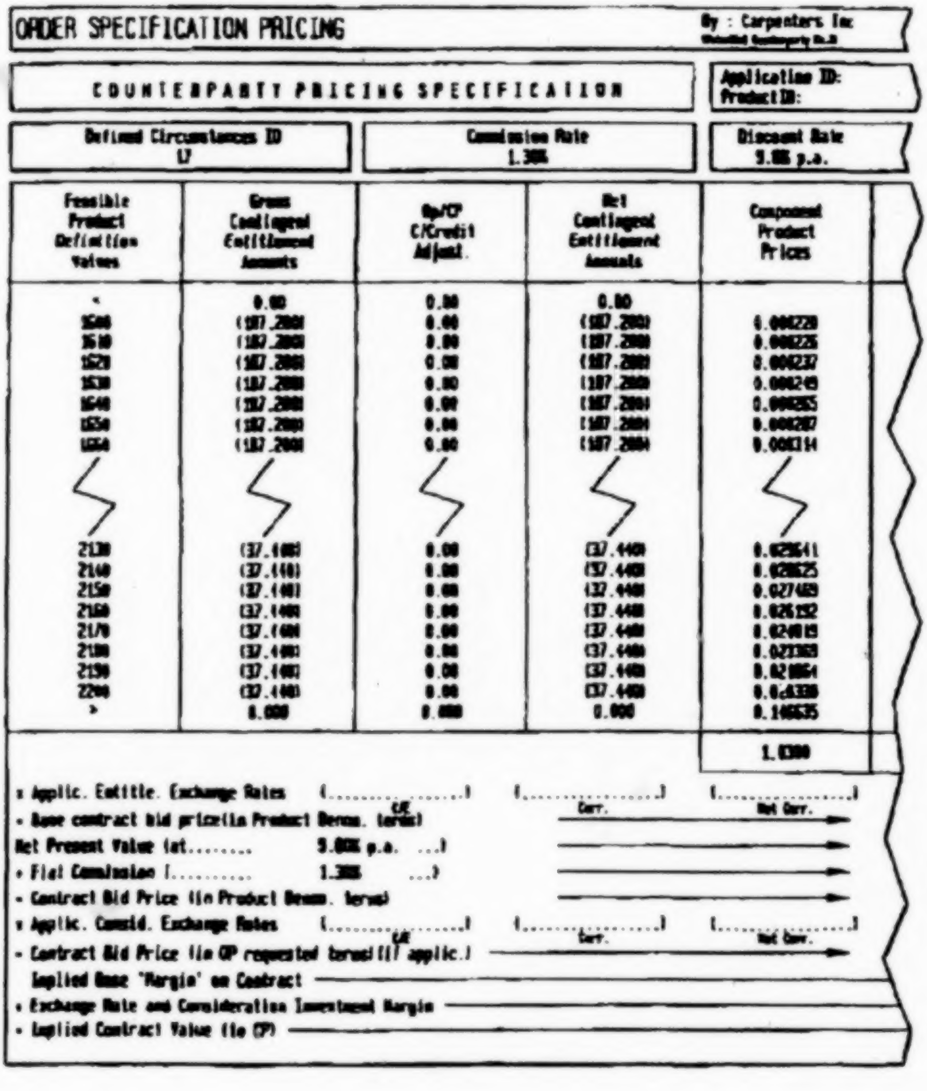
001
10061

Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(0.041)	0.000020	(0.004)	(0.004)	(187.200)
(0.042)	0.000027	(0.005)	(0.005)	
(0.044)	0.000037	(0.007)	(0.007)	
(0.047)	0.000049	(0.009)	(0.009)	
(0.050)	0.000065	(0.012)	(0.012)	
(0.054)	0.000087	(0.016)	(0.016)	
(0.058)	0.000114	(0.021)	(0.021)	
(1.110)	0.029442	(1.102)	(1.102)	
(1.072)	0.028425	(1.064)	(1.064)	
(1.020)	0.027269	(1.021)	(1.021)	
(0.981)	0.025993	(0.973)	(0.973)	
(0.929)	0.024619	(0.922)	(0.922)	
(0.875)	0.023163	(0.867)	(0.867)	
(0.819)	0.021665	(0.810)	(0.810)	
(0.761)	0.020130	(0.754)	(0.754)	
0.000	0.158035	0.000	0.000	
(59.500)	1.0000	(55.000)	(55.000)	(187.200)

FIG. 64A



ORDER SPECIFICATION PRICING

By : Carpenters Inc

COUNTERPARTY PRICING SPECIFICATION

Application ID:
Product ID:

Defined Circumstances ID
17

Commission Rate
1.30%

Discount Rate
5.0% p.a.

Feasible Product Definition Values	Gross Contingent Entitlement Amounts	Cp/CP C/Credit Adjust.	Net Contingent Entitlement Amounts	Component Product Prices
<	0.00	0.00	0.00	
1500	(187.2000)	0.00	(187.2000)	0.000220
1510	(187.2000)	0.00	(187.2000)	0.000225
1520	(187.2000)	0.00	(187.2000)	0.000237
1530	(187.2000)	0.00	(187.2000)	0.000249
1540	(187.2000)	0.00	(187.2000)	0.000265
1550	(187.2000)	0.00	(187.2000)	0.000287
1560	(187.2000)	0.00	(187.2000)	0.000314
2130	(37.440)	0.00	(37.440)	0.029641
2140	(37.440)	0.00	(37.440)	0.028625
2150	(37.440)	0.00	(37.440)	0.027469
2160	(37.440)	0.00	(37.440)	0.026152
2170	(37.440)	0.00	(37.440)	0.024619
2180	(37.440)	0.00	(37.440)	0.023369
2190	(37.440)	0.00	(37.440)	0.021864
2200	(37.440)	0.00	(37.440)	0.020338
>	0.000	0.000	0.000	0.146535
				1.0300

x Applic. Entitle. Exchange Rates (..................) (..................) (..................)

CfE Curr. Nat Curr.

= Base contract bid price(in Product Denom. terms)

Net Present Value (at........ 5.00% p.a. ...)

+ Flat Commission (.......... 1.30% ...)

= Contract Bid Price (in Product Denom. terms)

x Applic. Consid. Exchange Rates (..................) (..................) (..................)

CfE Curr. Nat Curr.

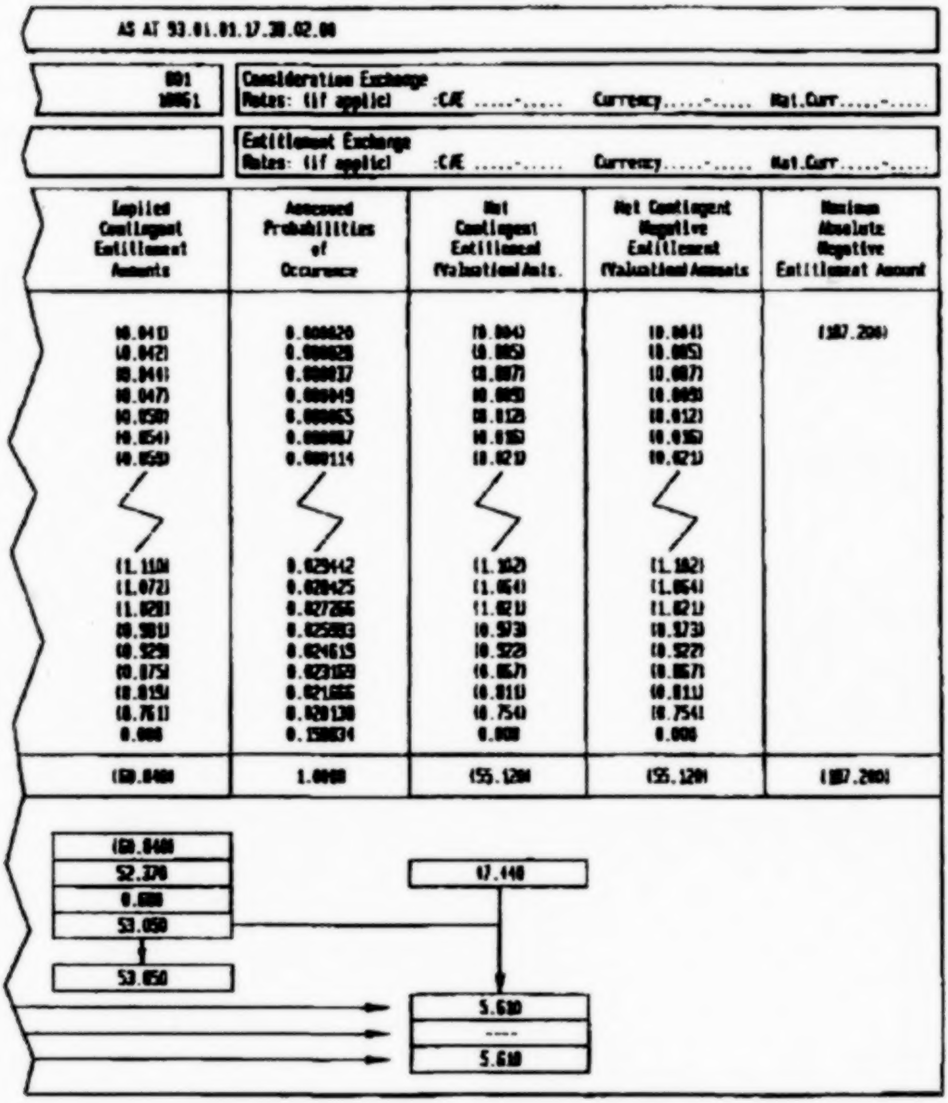
= Contract Bid Price (in CP requested terms)(if applic.)

Implied Base 'Margin' on Contract

+ Exchange Rate and Consideration Investment Margin

= Implied Contract Value (to CP)

FIG. 64B



AS AT 93.01.01.17.30.02.00

001
10061

Consideration Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Entitlement Exchange
Rates: (if applic) :C/E .....-..... Currency.....-..... Nat.Curr.....-.....

Implied Contingent Entitlement Amounts	Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amount
(0.041)	0.000020	(0.004)	(0.004)	(107.200)
(0.042)	0.000028	(0.005)	(0.005)	
(0.044)	0.000037	(0.007)	(0.007)	
(0.047)	0.000049	(0.009)	(0.009)	
(0.050)	0.000065	(0.012)	(0.012)	
(0.054)	0.000087	(0.016)	(0.016)	
(0.059)	0.000114	(0.021)	(0.021)	
(1.110)	0.029442	(1.102)	(1.102)	
(1.072)	0.028425	(1.064)	(1.064)	
(1.028)	0.027266	(1.021)	(1.021)	
(0.981)	0.025983	(0.973)	(0.973)	
(0.929)	0.024615	(0.922)	(0.922)	
(0.875)	0.023109	(0.867)	(0.867)	
(0.819)	0.021666	(0.811)	(0.811)	
(0.761)	0.020130	(0.754)	(0.754)	
0.000	0.150834	0.000	0.000	
(60.040)	1.0000	(55.120)	(55.120)	(107.200)

(60.040)
52.370
0.680
53.050

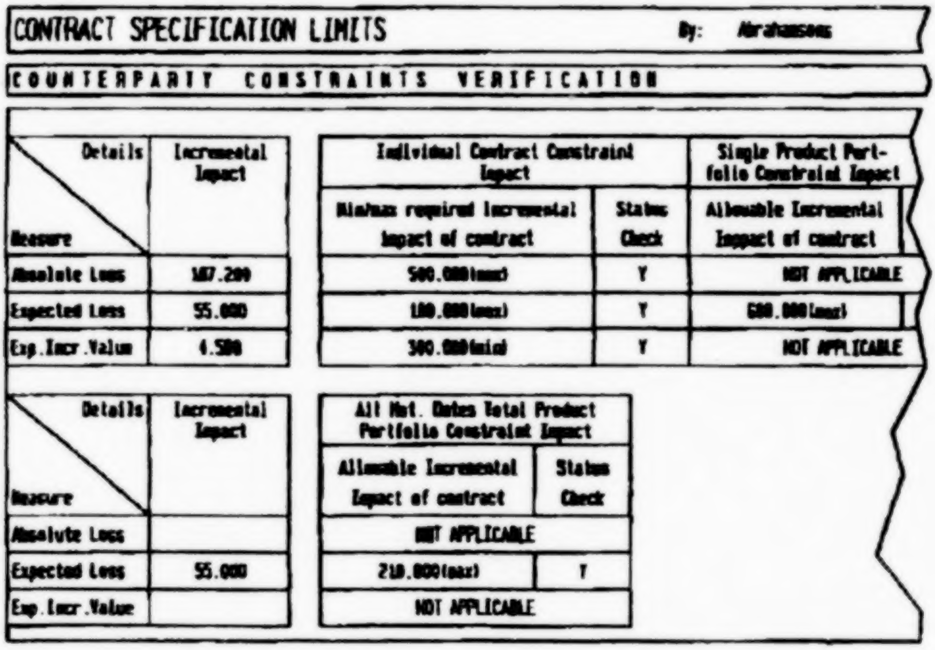
53.050

47.440

5.610

5.610

FIG. 65A



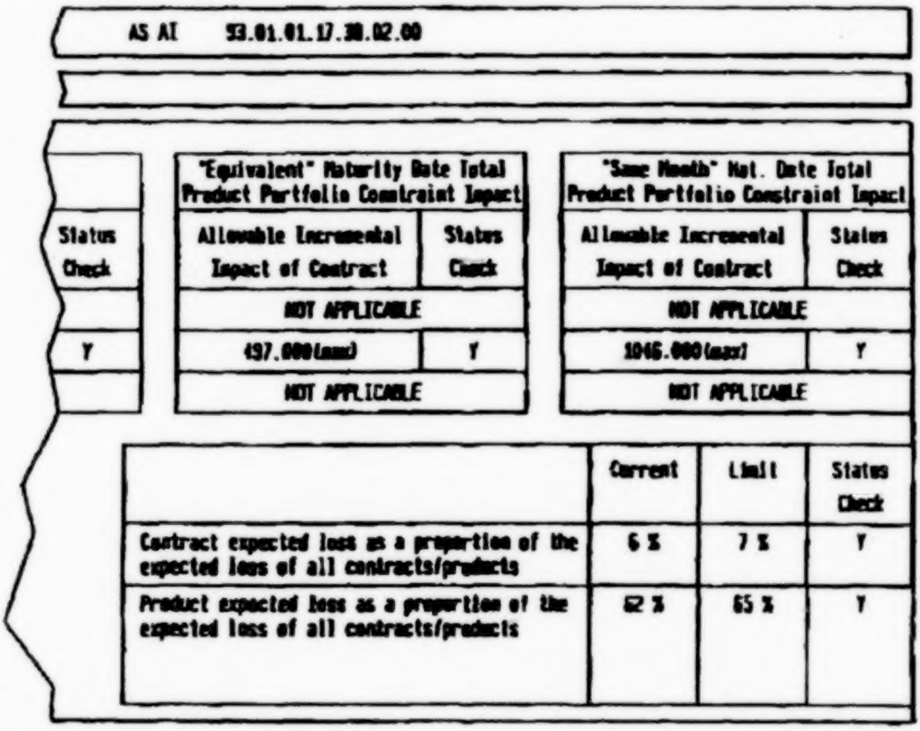
CONTRACT SPECIFICATION LIMITS By: Abrahamsons

COUNTERPARTY CONSTRAINTS VERIFICATION

Details / Measure	Incremental Impact	Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
		Min/max required Incremental Impact of contract	Status Check	Allowable Incremental Impact of contract
Absolute Loss	187.200	500.000(max)	Y	NOT APPLICABLE
Expected Loss	55.000	100.000(max)	Y	600.000(max)
Exp.Incr.Value	4.500	300.000(min)	Y	NOT APPLICABLE

Details / Measure	Incremental Impact	All Mat. Dates Total Product Portfolio Constraint Impact	
		Allowable Incremental Impact of contract	Status Check
Absolute Loss		NOT APPLICABLE	
Expected Loss	55.000	210.000(max)	Y
Exp.Incr.Value		NOT APPLICABLE	

FIG. 65B



AS AI 53.01.01.17.30.02.00

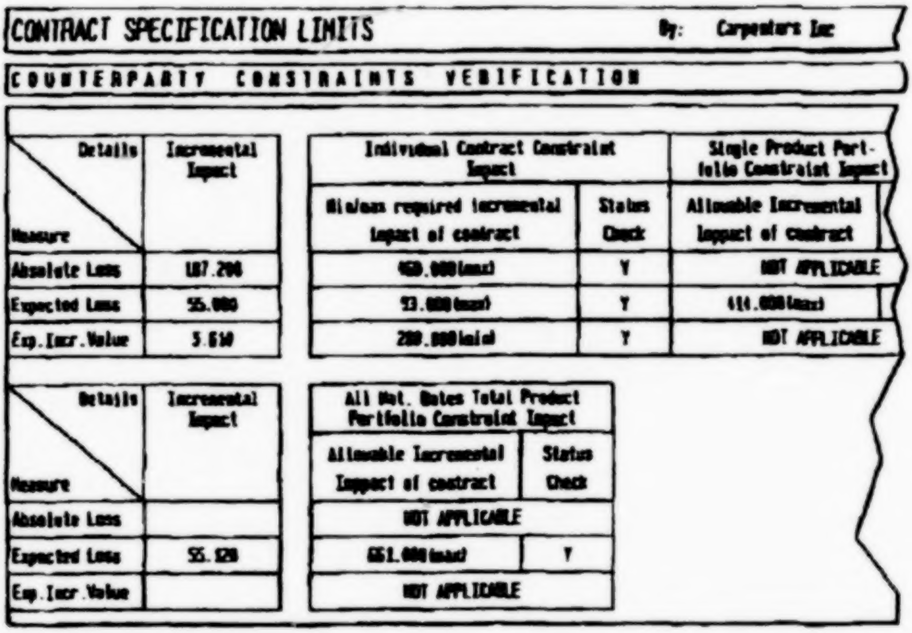
Status Check
Y

"Equivalent" Maturity Date Total Product Portfolio Constraint Impact	
Allowable Incremental Impact of Contract	Status Check
NOT APPLICABLE	
497.000(max)	Y
NOT APPLICABLE	

"Same Month" Mat. Date Total Product Portfolio Constraint Impact	
Allowable Incremental Impact of Contract	Status Check
NOT APPLICABLE	
1046.000(max)	Y
NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	6 %	7 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	62 %	65 %	Y

FIG. 66A



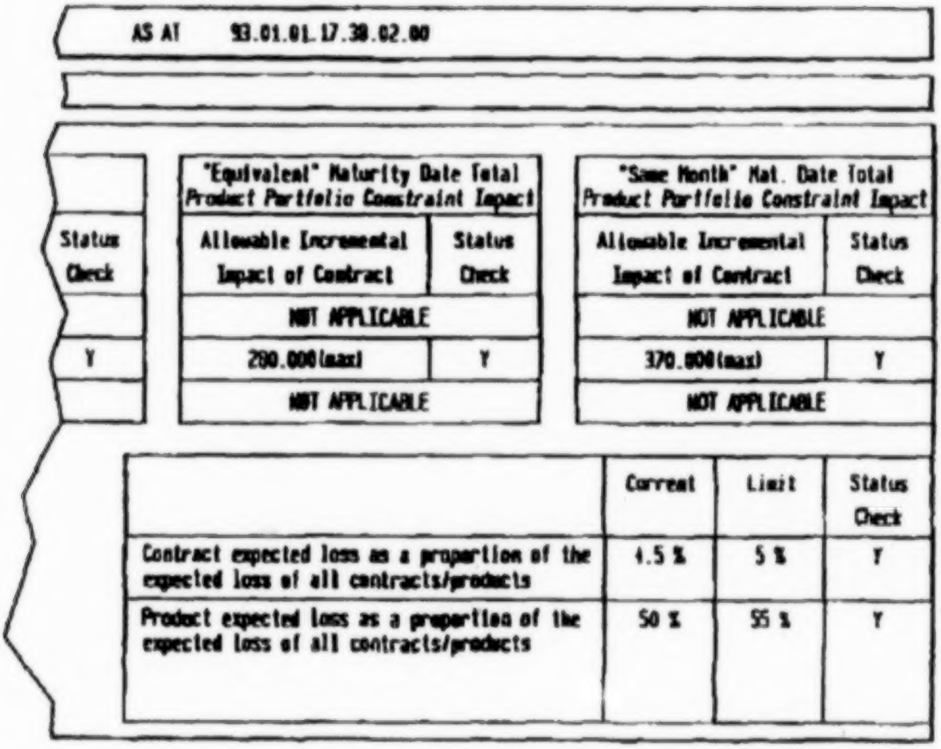
CONTRACT SPECIFICATION LIMITS By: Carpenters Inc

COUNTERPARTY CONSTRAINTS VERIFICATION

Details / Measure	Incremental Impact	Individual Contract Constraint Impact		Single Product Portfolio Constraint Impact
		Min/max required incremental impact of contract	Status Check	Allowable Incremental Impact of contract
Absolute Loss	187.200	450.000(max)	Y	NOT APPLICABLE
Expected Loss	55.000	93.000(max)	Y	414.000(max)
Exp.Incr.Value	3.610	200.000(min)	Y	NOT APPLICABLE

Details / Measure	Incremental Impact	All Mat. Dates Total Product Portfolio Constraint Impact	
		Allowable Incremental Impact of contract	Status Check
Absolute Loss		NOT APPLICABLE	
Expected Loss	55.120	651.000(max)	Y
Exp.Incr.Value		NOT APPLICABLE	

FIG. 66B

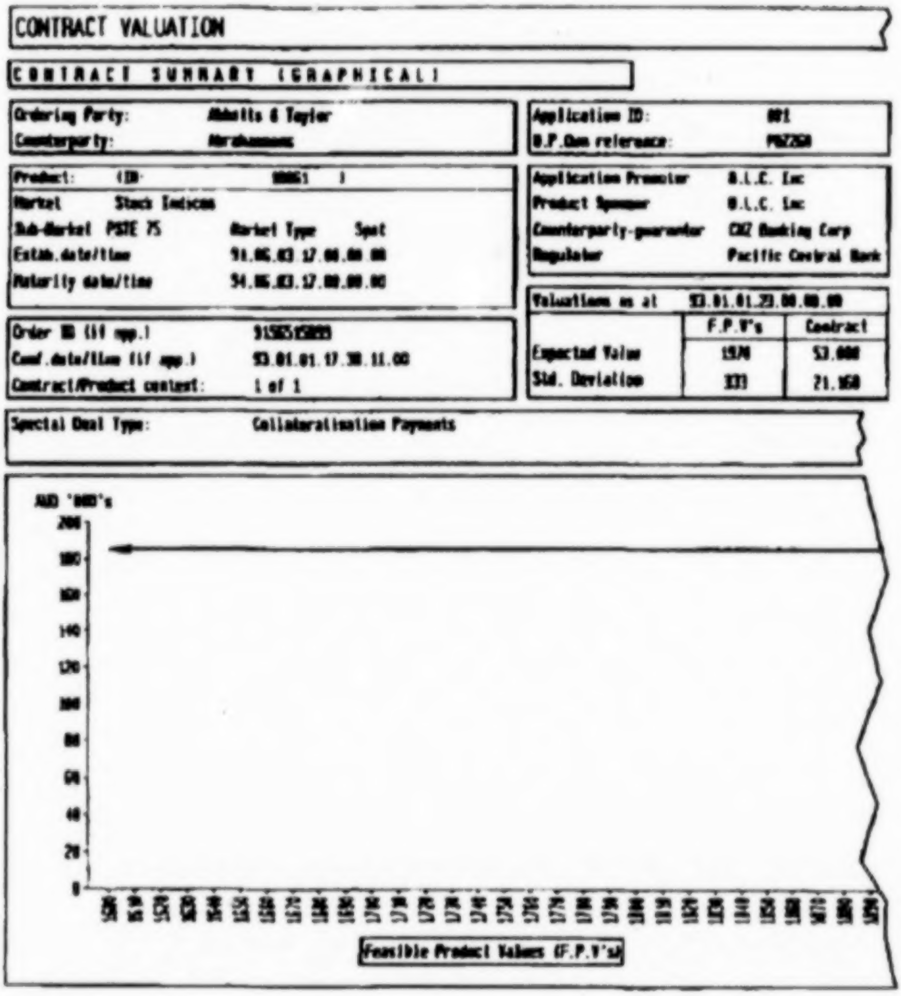


AS AT 93.01.01.17.30.02.00

	"Equivalent" Maturity Date Total *Product Portfolio Constraint Impact*		"Same Month" Mat. Date Total *Product Portfolio Constraint Impact*	
Status Check	Allowable Incremental Impact of Contract	Status Check	Allowable Incremental Impact of Contract	Status Check
	NOT APPLICABLE		NOT APPLICABLE	
Y	280.000(max)	Y	370.000(max)	Y
	NOT APPLICABLE		NOT APPLICABLE	

	Current	Limit	Status Check
Contract expected loss as a proportion of the expected loss of all contracts/products	4.5 %	5 %	Y
Product expected loss as a proportion of the expected loss of all contracts/products	50 %	55 %	Y

FIG. 67A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Abbotts & Taylor
Counterparty: Abrahamsons

Application ID: 001
B.P.Own reference: P67250

Product: (ID: 00061)
Market Stock Indices
Sub-Market PSIE 75 Market Type Spot
Estab.date/time 91.06.03 17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CBZ Banking Corp
Regulator Pacific Central Bank

Order ID (if app.) 9150515005
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product content: 1 of 1

Valuations as at 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1970	53.000
Std. Deviation	331	21.160

Special Deal Type: Collateralisation Payments

FIG. 67B

AS AT: 53.01.01.23.00.00.00 Report for: Abbotts & Taylor

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	51,520	As below

Pricing and Matching Process:

Minimize pre-tax consideration payment under an EV/CE regime

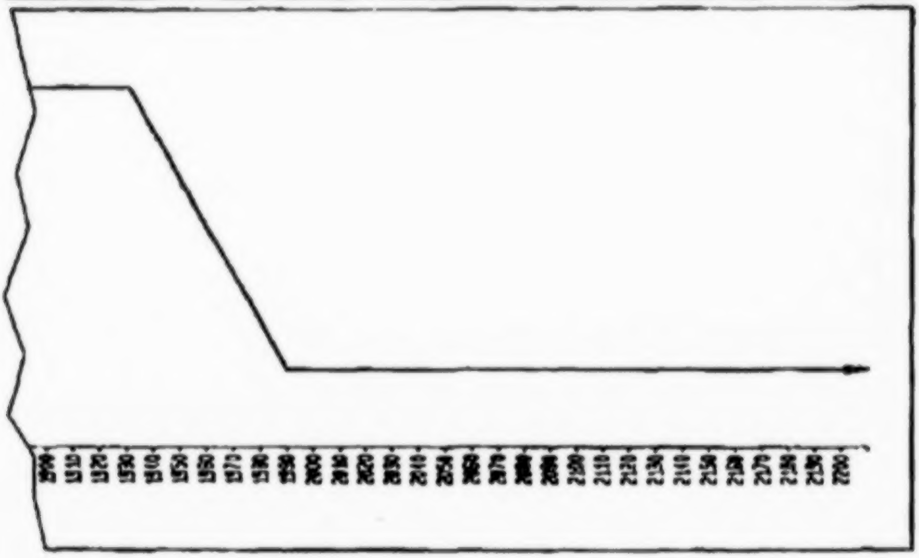
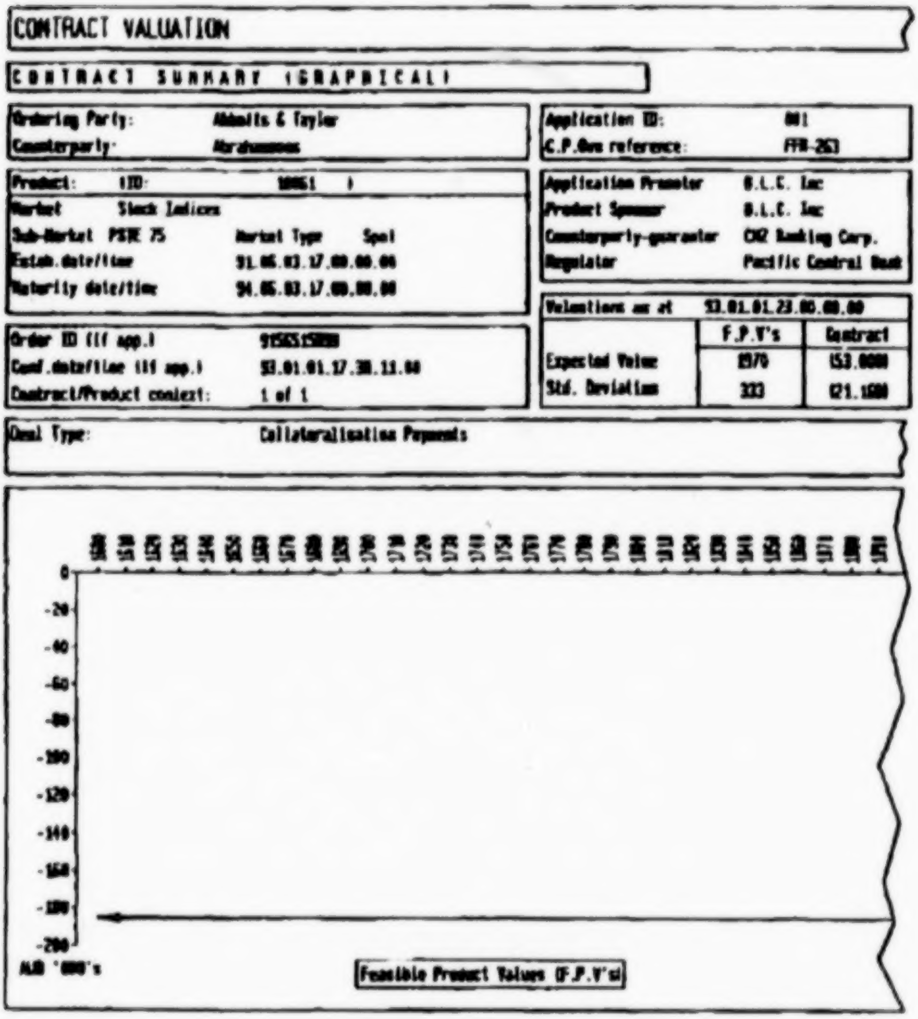


FIG. 68A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Abbotts & Taylor
Counterparty: Abrahamsons

Application ID: 001
C.P.Gen reference: FFR-263

Product: (ID: 10061)
Market Stock Indices
Sub-Market PSTE 75 Market Type Spot
Estab. date/time 91.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CHZ Banking Corp.
Regulator Pacific Central Bank

Order ID (if app.) 9156515000
Conf. date/time (if app.) 93.01.01.17.30.11.00
Contract/Product context: 1 of 1

Valuations as at 93.01.01.23.00.00.00

	F.P.V's	Contract
Expected Value	1970	153.0000
Std. Deviation	333	121.1000

Deal Type: Collateralisation Payments

FIG. 68B

AG AF 53.01.01.23.00.00.00 Report for: Abrahamsons

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Cen Bnk dep.	Cen Bnk dep.	Cen Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	51,529	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

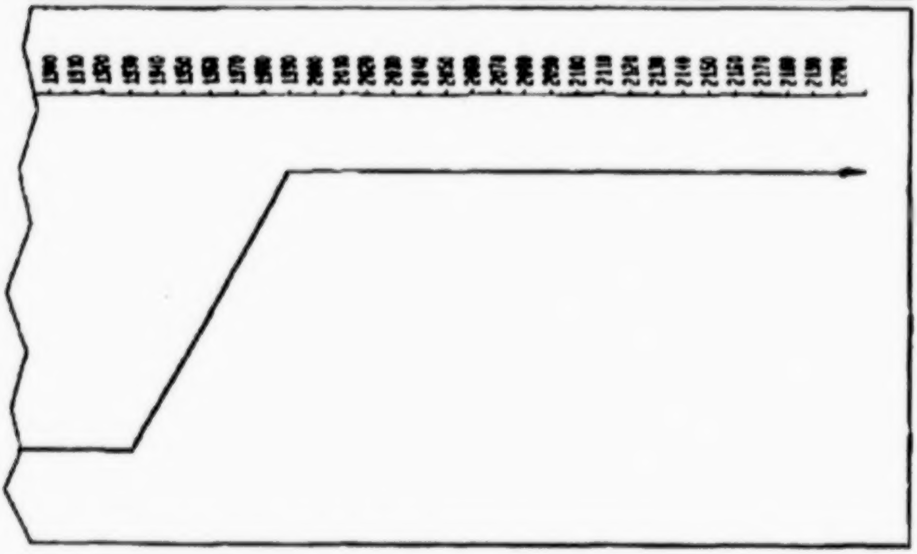
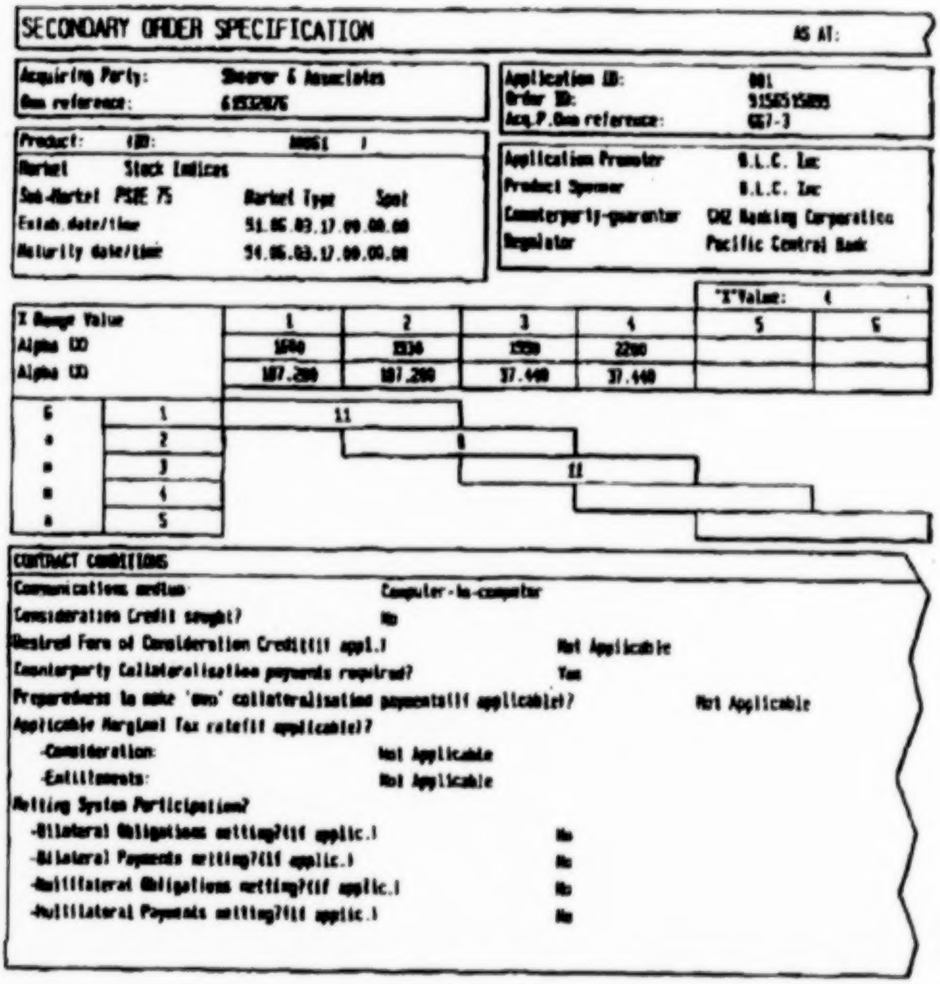


FIG. 69A



SECONDARY ORDER SPECIFICATION AS AT:

Acquiring Party: Shearer & Associates
Own reference: 61532076

Application ID: 001
Order ID: 3156515085
Acq.P.Own reference: 667-3

Product: (ID: A0061)
Market Stock Indices
Sub-Market PSIE 75 Market Type Spot
Estab.date/time 51.06.03.17.00.00.00
Maturity date/time 54.06.03.17.00.00.00

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CHZ Banking Corporation
Regulator Pacific Central Bank

"X"Value: 4

X Range Value	1	2	3	4	5	6
Alpha (X)	1600	1536	1950	2200		
Alpha (X)	107.200	107.200	37.440	37.440		

G	1	11					
a	2		8				
m	3			11			
m	4						
a	5						

CONTRACT CONDITIONS

Communications medium: Computer-to-computer
Consideration Credit sought? No
Desired Form of Consideration Credit(if appl.) Not Applicable
Counterparty Collateralisation payments required? Yes
Preparedness to make 'own' collateralisation payments(if applicable)? Not Applicable
Applicable Marginal Tax rate(if applicable)?
-Consideration: Not Applicable
-Entitlements: Not Applicable
Netting System Participation?
-Bilateral Obligations netting?(if applic.) No
-Bilateral Payments netting?(if applic.) No
-Multilateral Obligations netting?(if applic.) No
-Multilateral Payments netting?(if applic.) No

FIG. 69B

53.06.06.00.00.00.00

	Consideration/ Entitlement Organisation	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if applic.)	Com Bnk Dep	Com Bnk Dep	Com Bnk Dep
National Curr.type(if applic.)	AUD	AUD	AUD
Max.Consid.Amount	N.A.	60,000	As below

Pricing and Matching Process:
Minimize pre-tax consideration payment under an ET/CE regime

SPECIAL DEAL TYPE: Collateralisation Payments

Partial Matches desired? Yes
Manual Approval of Matches desired? No
Desired degree of trading
Transparency(if applicable) Not Applicable
Applicable Consid./Entitlement Transfer Entity
Account details: ABC Banking Corp
Operating A/c 1-1-502026-046752-0 (and 1)
Desired date/time of Order Submission: Immediate
Desired Order retention perid: 00.00.01.00.00.00
Desired Max.time for counterparty
manual order approval(if applic.): Not Applicable

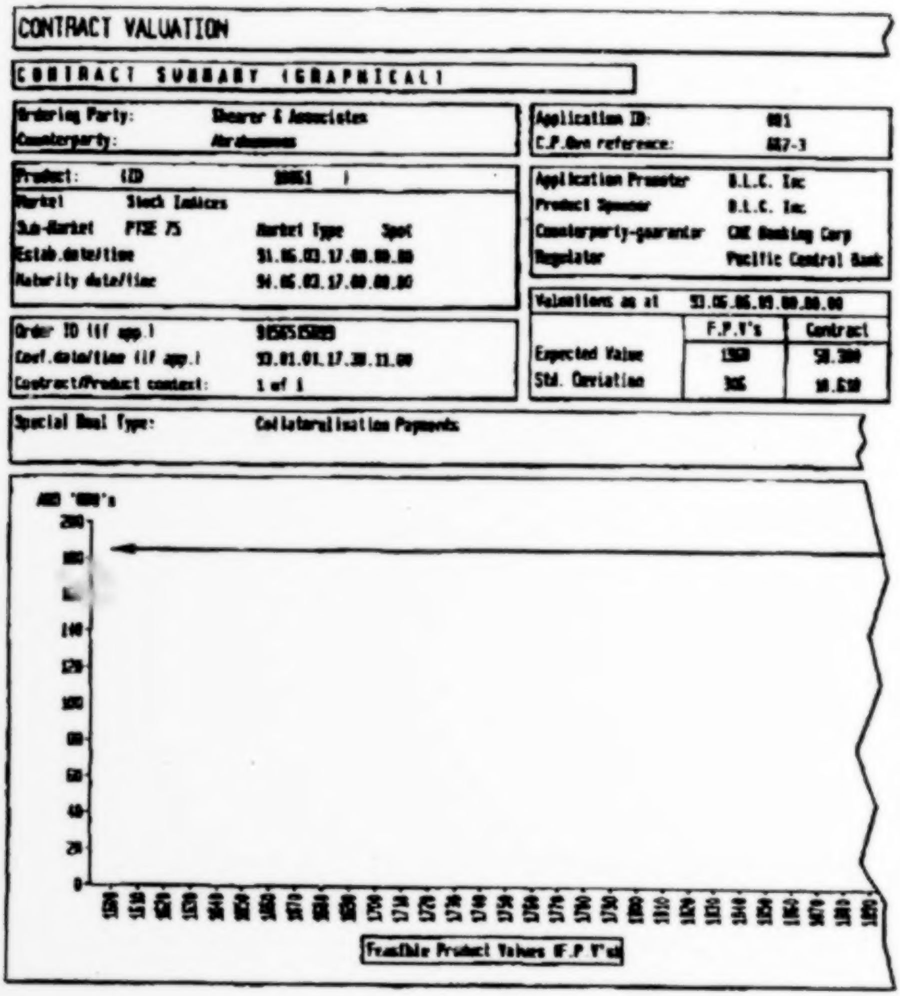
Preferred/Preferential Dealing:

NIL

Unacceptable Counterparties and Other Stakeholders

NIL

FIG. 70A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party:	Shearer & Associates
Counterparty:	[illegible]

Product: (ID 10051)

Market	Stock Indices		
Sub-Market	FTSE 75	Market Type	Spot
Estab.date/time		91.06.03.17.00.00.00	
Maturity date/time		94.06.03.17.00.00.00	

Order ID (if app.)	9656515000
Conf.date/time (if app.)	93.01.01.17.30.11.00
Contract/Product context:	1 of 1

Application ID:	001
C.P.Own reference:	667-3

Application Promoter	B.L.C. Inc
Product Sponsor	B.L.C. Inc
Counterparty-guarantor	CBE Banking Corp
Regulator	Pacific Central Bank

Valuations as at 93.06.06.09.00.00.00

	F.P.V's	Contract
Expected Value	1560	58.300
Std. Deviation	306	10.610

Special Deal Type: Collateralisation Payments

FIG. 70B

AS AT 53.06.06.05.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50.300	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

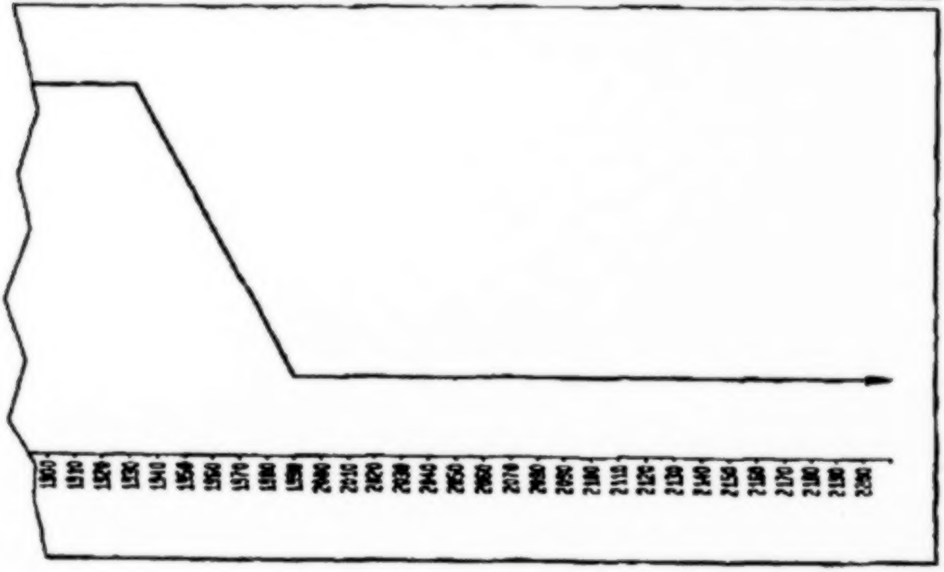
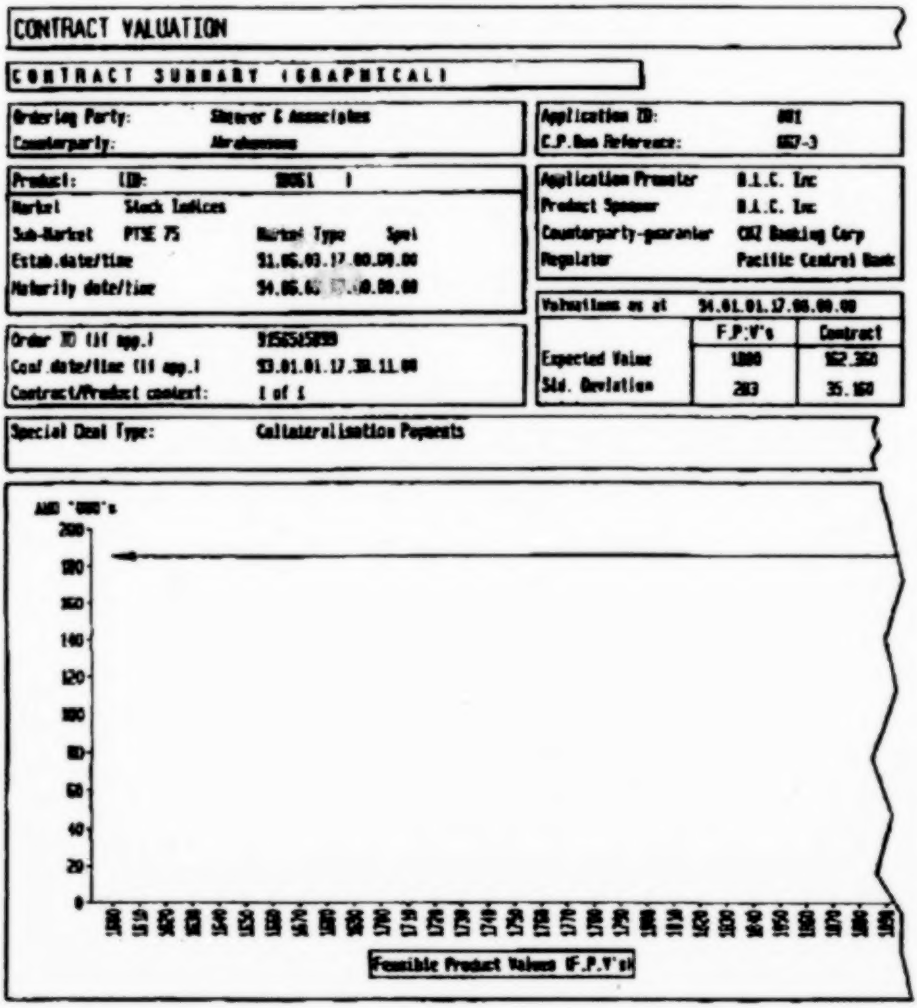


FIG. 71A



CONTRACT VALUATION

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Shearer & Associates
Counterparty: Abrahamsons

Application ID: 001
C.P. Bus Reference: 667-3

Product: (ID: 10051)
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab.date/time 91.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Application Promoter B.I.C. Inc
Product Sponsor B.I.C. Inc
Counterparty-guarantor CXZ Banking Corp
Regulator Pacific Central Bank

Order ID (if app.) 9156515099
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product context: 1 of 1

Valuations as at 94.01.01.17.00.00.00

	F.P.V's	Contract
Expected Value	1000	162.350
Std. Deviation	283	35.160

Special Deal Type: Collateralisation Payments

FIG. 71B

AS AT 34.01.01.17.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50,300	As below

Pricing and Matching Process: Minimize pre-tax considera'ion payment under an EV/CE regime

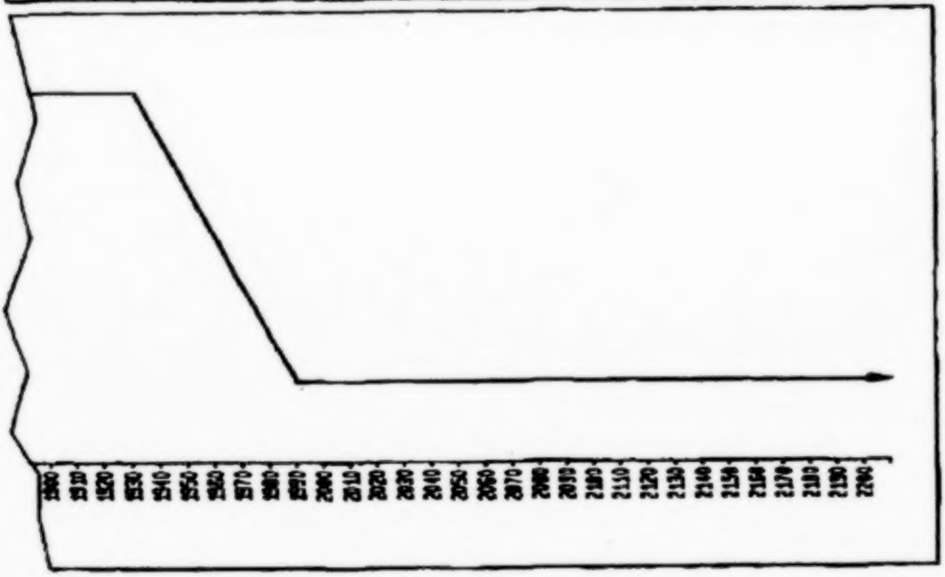
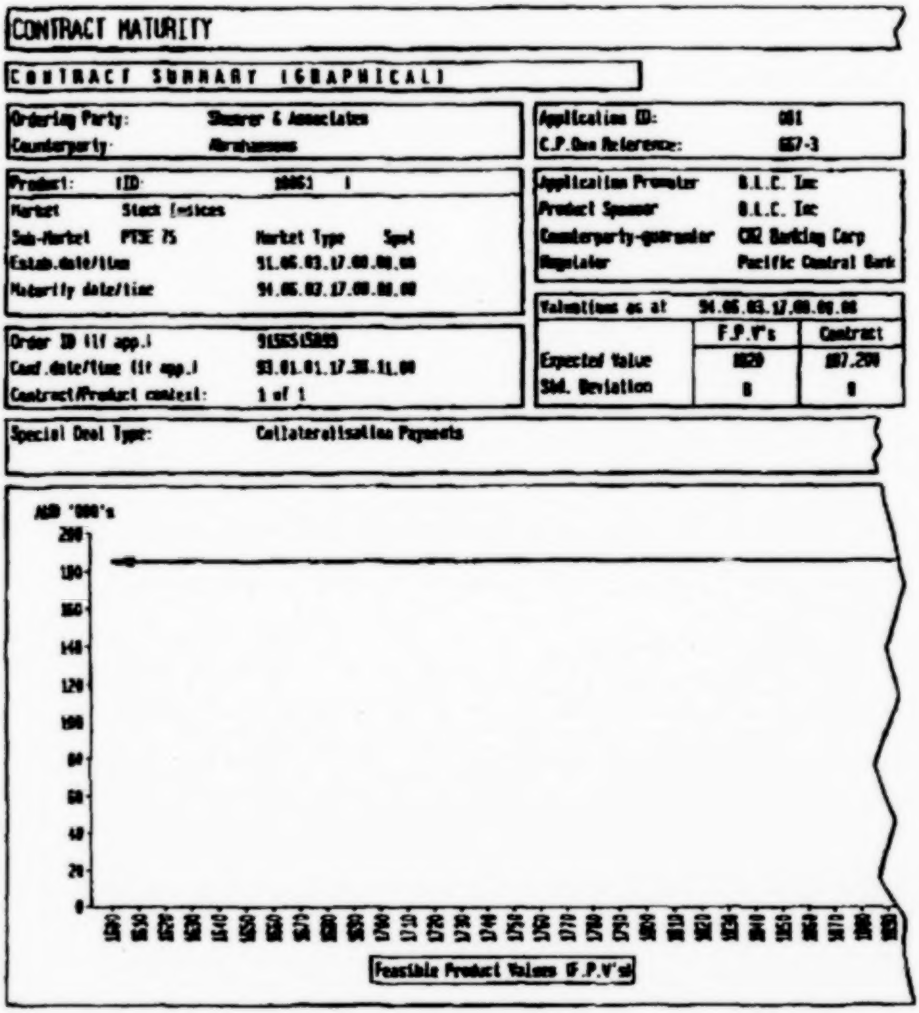


FIG. 72A



CONTRACT MATURITY

CONTRACT SUMMARY (GRAPHICAL)

Ordering Party: Shearer & Associates
Counterparty: Abrahamsons

Product: (ID: 10061 1
Market Stock Indices
Sub-Market FTSE 75 Market Type Spot
Estab.date/time 91.06.03.17.00.00.00
Maturity date/time 94.06.03.17.00.00.00

Order ID (if app.) 9156515089
Conf.date/time (if app.) 93.01.01.17.30.11.00
Contract/Product context: 1 of 1

Application ID: 001
C.P.One Reference: 667-3

Application Promoter B.L.C. Inc
Product Sponsor B.L.C. Inc
Counterparty-guarantor CBQ Banking Corp
Regulator Pacific Central Bank

Valuations as at 94.06.03.17.00.00.00

	F.P.V's	Contract
Expected Value	1020	187,200
Std. Deviation	0	0

Special Deal Type: Collateralisation Payments

AUD '000's
200
180
160
140
120
100
80
60
40
20
0
1600
1610
1620
1630
1640
1650
1660
1670
1680
1690
1700
1710
1720
1730
1740
1750
1760
1770
1780
1790
1800
1810
1820
1830
1840
1850
1860
1870
1880
1890
1900
Feasible Product Values (F.P.V's)

FIG. 72B

AS AT 94.06.03.17.00.00.00 Report for: Shearer & Associates

	Consideration/ Entitlement Denomination	Consideration	Entitlement
Cons./Entitlement type	Money	Money	Money
Currency type(if appl	Com Bnk dep.	Com Bnk dep.	Com Bnk dep.
National Curr.type(if applic.)	AUD.	AUD.	AUD.
Amount	N.A.	50.300	As below

Pricing and Matching Process: Minimize pre-tax consideration payment under an EV/CE regime

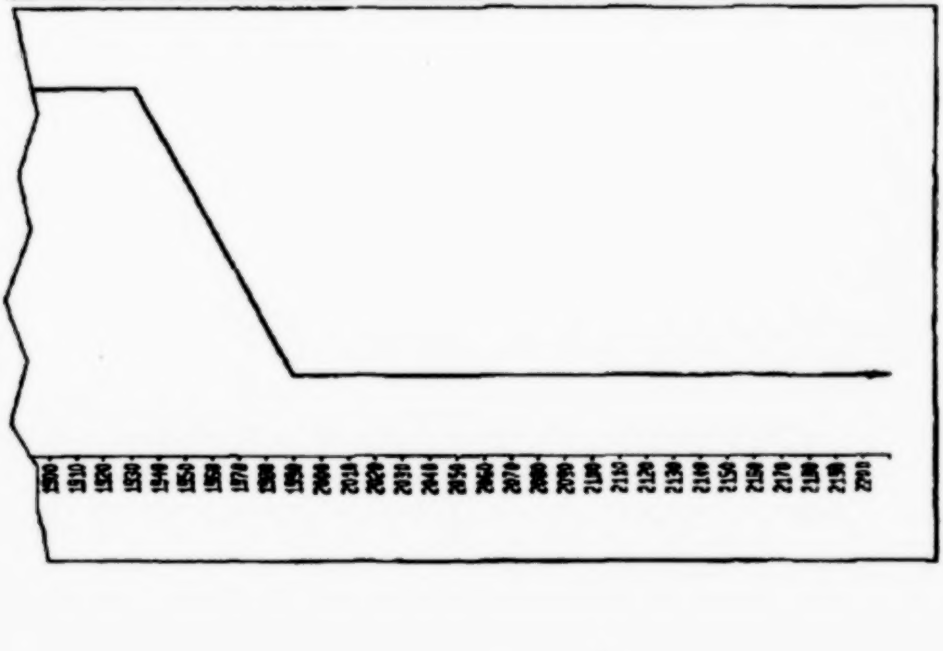
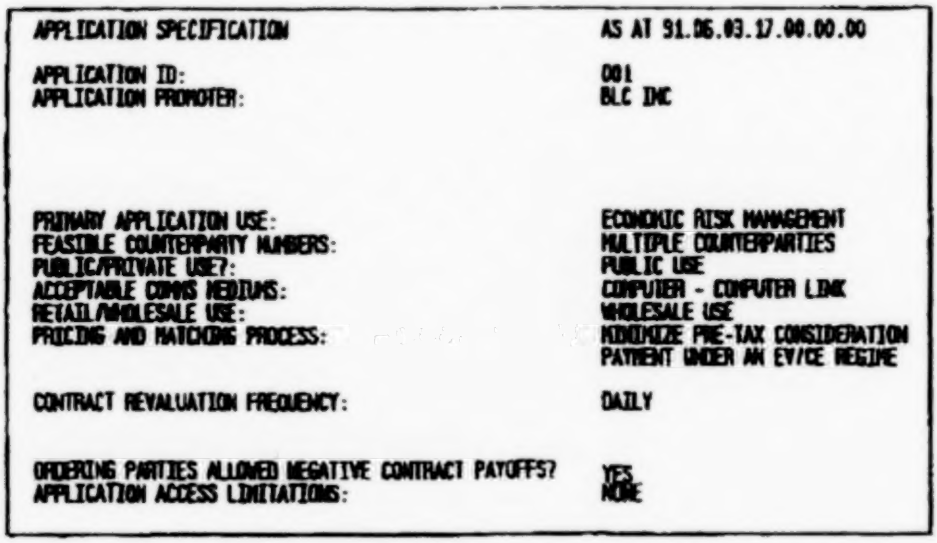


FIG. 73



APPLICATION SPECIFICATION AS AT 91.06.03.17.00.00.00

APPLICATION ID: 001
APPLICATION PROMOTER: BLC INC

PRIMARY APPLICATION USE: ECONOMIC RISK MANAGEMENT
FEASIBLE COUNTERPARTY NUMBERS: MULTIPLE COUNTERPARTIES
PUBLIC/PRIVATE USE?: PUBLIC USE
ACCEPTABLE COMMS MEDIUMS: COMPUTER - COMPUTER LINK
RETAIL/WHOLESALE USE: WHOLESALE USE
PRICING AND MATCHING PROCESS: MINIMIZE PRE-TAX CONSIDERATION PAYMENT UNDER AN EV/CE REGIME

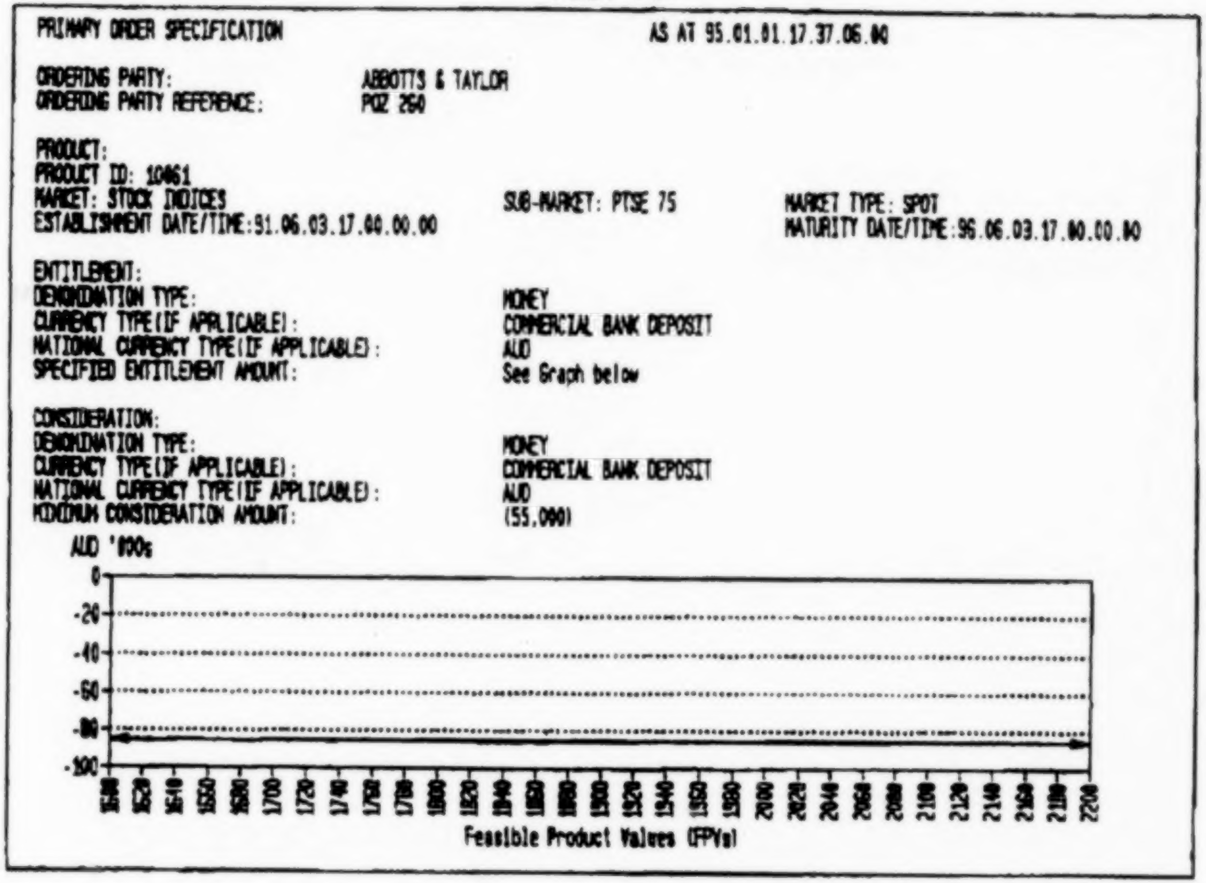
CONTRACT REVALUATION FREQUENCY: DAILY

ORDERING PARTIES ALLOWED NEGATIVE CONTRACT PAYOFFS? YES
APPLICATION ACCESS LIMITATIONS: NONE

FIG. 74

PRODUCT SPECIFICATION	AS AT 91.06.03.17.00.00.00
PRODUCT ID:	10061
PRODUCT SUMMARY:	
APPLICATION ID:	001
APPLICATION PROMOTER:	BLC INC
PRODUCT SPECIFICATIONS:	
MARKET:	STOCK INDICES
SUBMARKET:	PTSE 75
MARKET TYPE:	SPOT
ESTABLISHMENT DATE/TIME:	91.06.03.17.00.00.00
MATURITY DATE/TIME:	96.06.03.17.00.00.00
CONSIDERATION/ENTITLEMENT DENOMINATION TYPE:	MONEY
CURRENCY TYPE(IF APPLICABLE):	COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):	AUD
MINIMUM PRODUCT DEFINITION VALUE:	1600
MAXIMUM PRODUCT DEFINITION VALUE:	2200
PRODUCT STEP VALUE:	10

FIG. 75



PRIMARY ORDER SPECIFICATION AS AT 95.01.01.17.37.06.00

ORDERING PARTY: ABBOTTS & TAYLOR
ORDERING PARTY REFERENCE: POZ 260

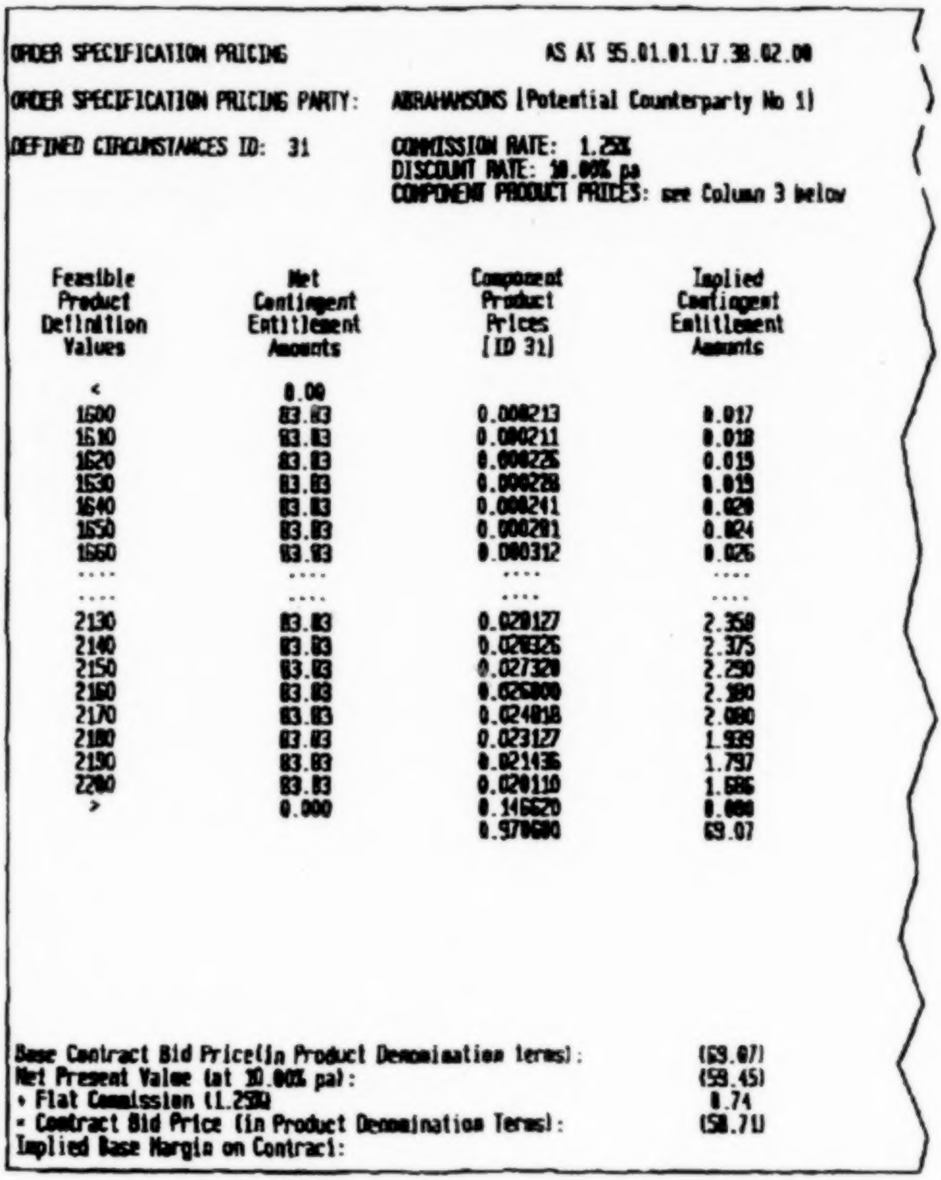
PRODUCT:
PRODUCT ID: 10061
MARKET: STOCK INDICES SUB-MARKET: PTSE 75 MARKET TYPE: SPOT
ESTABLISHMENT DATE/TIME: 91.06.03.17.00.00.00 MATURITY DATE/TIME: 96.06.03.17.00.00.00

ENTITLEMENT:
DENOMINATION TYPE: MONEY
CURRENCY TYPE(IF APPLICABLE): COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE): AUD
SPECIFIED ENTITLEMENT AMOUNT: See Graph below

CONSIDERATION:
DENOMINATION TYPE: MONEY
CURRENCY TYPE(IF APPLICABLE): COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE): AUD
MINIMUM CONSIDERATION AMOUNT: (55,000)

AUD '000s
0
-20
-40
-60
-80
-100
1600
1620
1640
1660
1680
1700
1720
1740
1760
1780
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
2020
2040
2060
2080
2100
2120
2140
2160
2180
2200
Feasible Product Values (FPVs)

FIG. 76A



ORDER SPECIFICATION PRICING AS AT 95.01.01.17.38.02.00

ORDER SPECIFICATION PRICING PARTY: ABRAHAMSONS (Potential Counterparty No 1)

DEFINED CIRCUMSTANCES ID: 31

COMMISSION RATE: 1.25%
DISCOUNT RATE: 10.00% pa
COMPONENT PRODUCT PRICES: see Column 3 below

Feasible Product Definition Values	Net Contingent Entitlement Amounts	Component Product Prices (ID 31)	Implied Contingent Entitlement Amounts
<	0.00		
1600	83.83	0.000213	0.017
1610	83.83	0.000211	0.018
1620	83.83	0.000225	0.019
1630	83.83	0.000228	0.019
1640	83.83	0.000241	0.020
1650	83.83	0.000281	0.024
1660	83.83	0.000312	0.026
....	....	....	....
....	....	....	....
2130	83.83	0.028127	2.358
2140	83.83	0.028326	2.375
2150	83.83	0.027320	2.290
2160	83.83	0.026000	2.180
2170	83.83	0.024818	2.080
2180	83.83	0.023127	1.939
2190	83.83	0.021436	1.797
2200	83.83	0.020110	1.686
>	0.000	0.146620	0.000
		0.970600	69.07

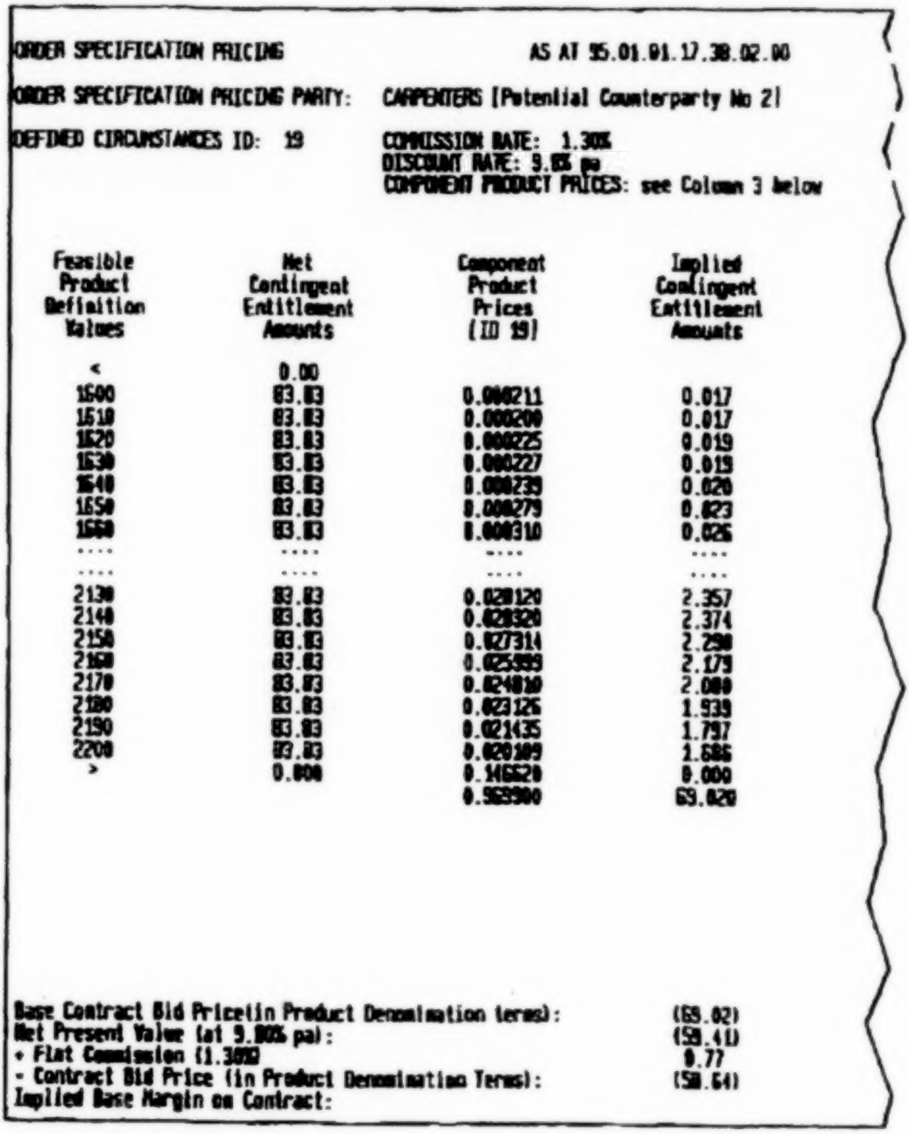
Base Contract Bid Price(in Product Denomination terms):	(69.07)
Net Present Value (at 10.00% pa):	(59.45)
+ Flat Commission (1.25%)	0.74
= Contract Bid Price (in Product Denomination Terms):	(58.71)
Implied Base Margin on Contract:	

FIG. 76B

Application ID: 001
ProductID: 10061

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
0.000020	0.002		
0.000027	0.002		
0.000037	0.003		
0.000049	0.004		
0.000066	0.006		
0.000087	0.007		
0.000114	0.010		
....	....		
....	....		
0.029442	2.468		
0.028425	2.383		
0.027269	2.286		
0.025993	2.179		
0.024619	2.064		
0.023169	1.942		
0.021665	1.816		
0.020130	1.687		
0.158835	0.000		
1.0000	70.51		
	(70.51)		
	(68.93)		
	1.58		

FIG. 77A



ORDER SPECIFICATION PRICING AS AT 95.01.01.17.38.02.00

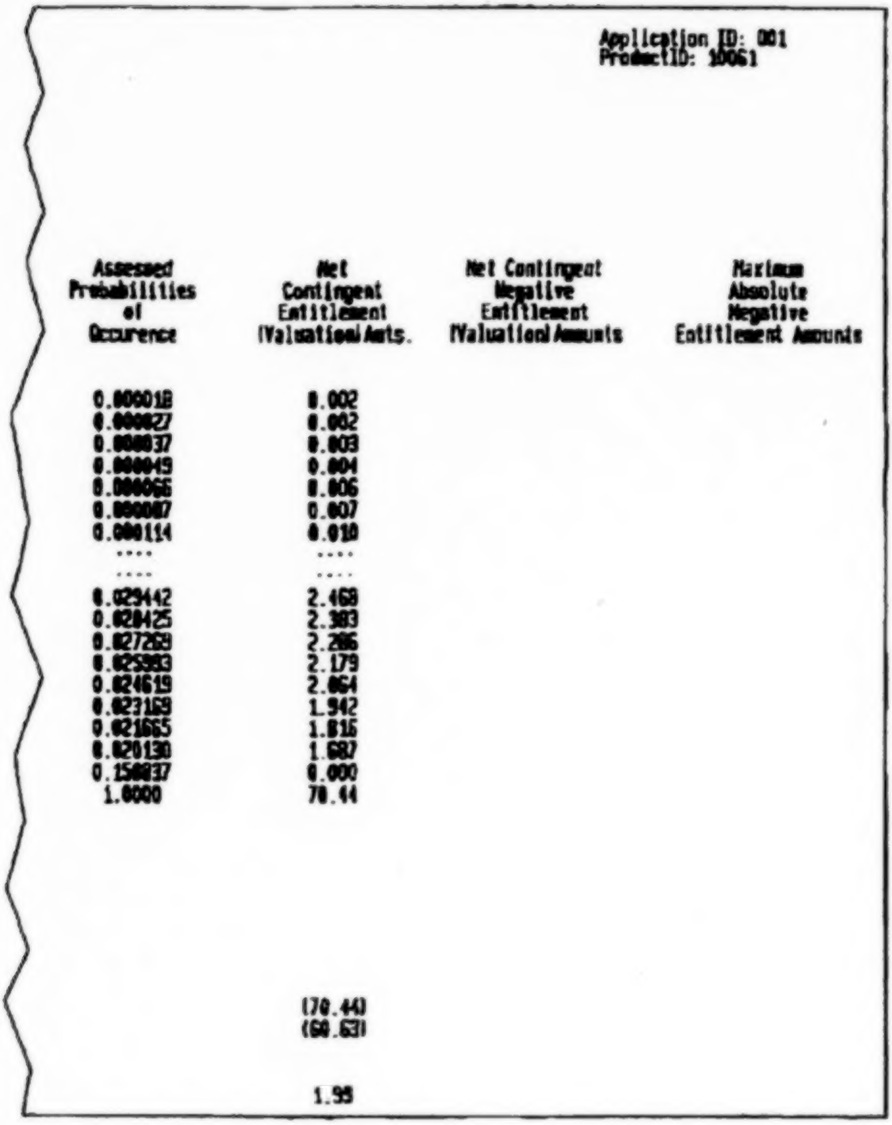
ORDER SPECIFICATION PRICING PARTY: CARPENTERS [Potential Counterparty No 2]

DEFINED CIRCUMSTANCES ID: 19
COMMISSION RATE: 1.30%
DISCOUNT RATE: 9.8% pa
COMPONENT PRODUCT PRICES: see Column 3 below

Feasible Product Definition Values	Net Contingent Entitlement Amounts	Component Product Prices (ID 19)	Implied Contingent Entitlement Amounts
<	0.00		
1600	83.83	0.000211	0.017
1610	83.83	0.000200	0.017
1620	83.83	0.000225	0.019
1630	83.83	0.000227	0.019
1640	83.83	0.000239	0.020
1650	83.83	0.000279	0.023
1660	83.83	0.000310	0.026
....	....	....	....
....	....	....	....
2130	83.83	0.028120	2.357
2140	83.83	0.028320	2.374
2150	83.83	0.027314	2.290
2160	83.83	0.025999	2.179
2170	83.83	0.024810	2.080
2180	83.83	0.023126	1.939
2190	83.83	0.021435	1.797
2200	83.83	0.020109	1.686
>	0.000	0.146620	0.000
		0.969900	69.020

Base Contract Bid Price(in Product Denomination terms):	(69.02)
Net Present Value (at 9.80% pa):	(59.41)
+ Flat Commission (1.30%)	0.77
- Contract Bid Price (in Product Denomination Terms):	(58.64)
Implied Base Margin on Contract:	

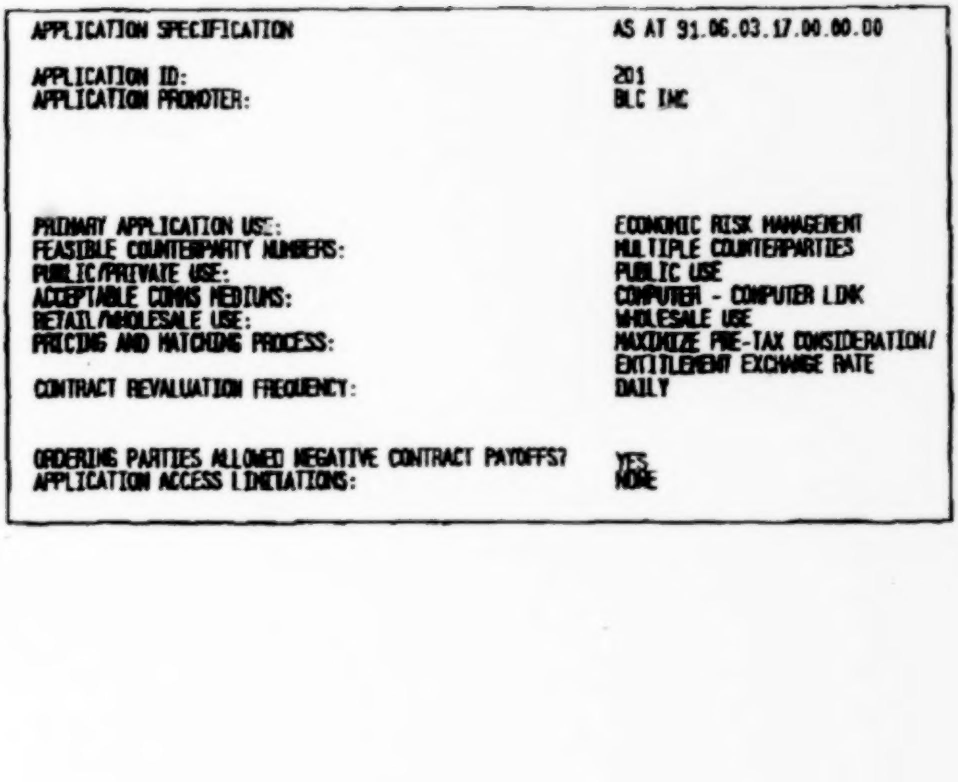
FIG. 77B



Application ID: 001
ProductID: 10061

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
0.000018	0.002		
0.000027	0.002		
0.000037	0.003		
0.000049	0.004		
0.000066	0.006		
0.000087	0.007		
0.000114	0.010		
....	....		
....	....		
0.029442	2.468		
0.028425	2.383		
0.027269	2.286		
0.025983	2.179		
0.024619	2.064		
0.023169	1.942		
0.021665	1.816		
0.020130	1.687		
0.150837	0.000		
1.0000	70.44		
	(70.44)		
	(60.63)		
	1.99		

FIG. 78



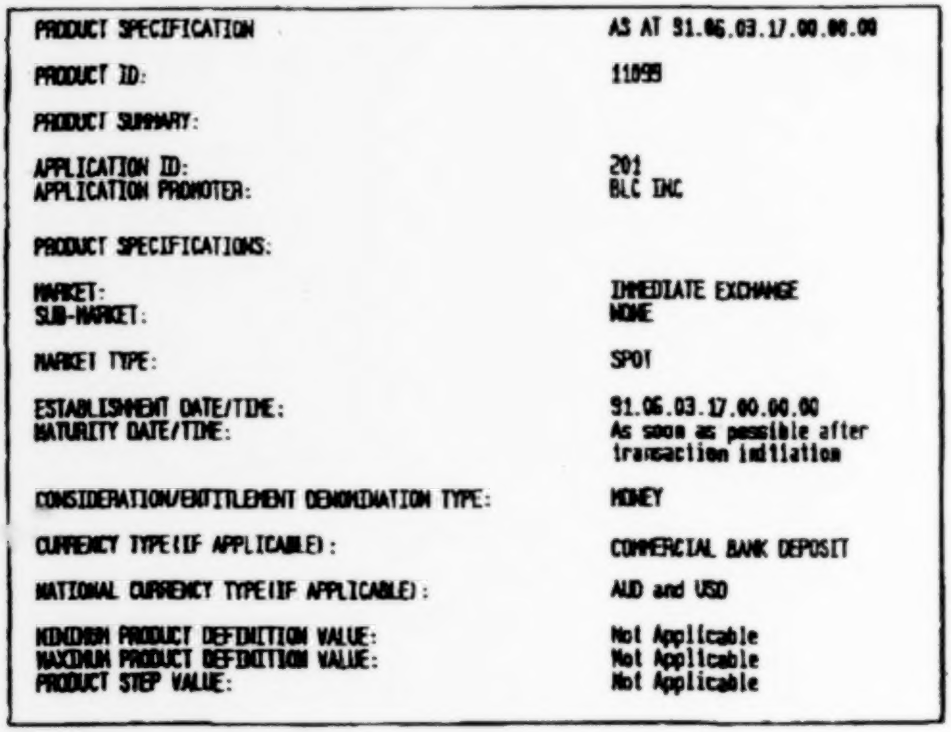
APPLICATION SPECIFICATION AS AT 91.06.03.17.00.00.00

APPLICATION ID: 201
APPLICATION PROMOTER: BLC INC

PRIMARY APPLICATION USE: ECONOMIC RISK MANAGEMENT
FEASIBLE COUNTERPARTY NUMBERS: MULTIPLE COUNTERPARTIES
PUBLIC/PRIVATE USE: PUBLIC USE
ACCEPTABLE COMMS MEDIUMS: COMPUTER - COMPUTER LINK
RETAIL/WHOLESALE USE: WHOLESALE USE
PRICING AND MATCHING PROCESS: MAXIMIZE PRE-TAX CONSIDERATION/ ENTITLEMENT EXCHANGE RATE
CONTRACT REVALUATION FREQUENCY: DAILY

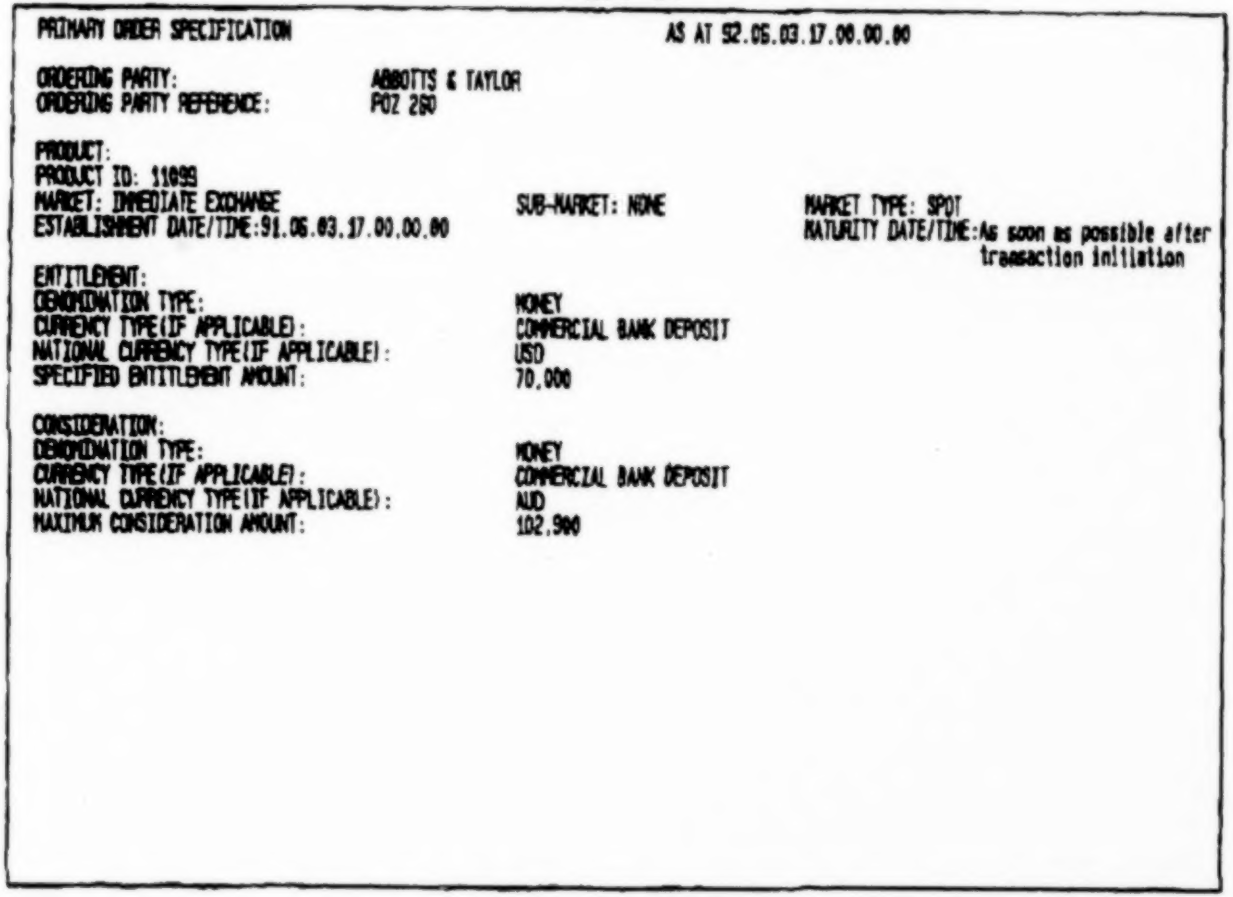
ORDERING PARTIES ALLOWED NEGATIVE CONTRACT PAYOFFS? YES
APPLICATION ACCESS LIMITATIONS: NONE

FIG. 79



PRODUCT SPECIFICATION	AS AT 91.06.03.17.00.00.00
PRODUCT ID:	11099
PRODUCT SUMMARY:	
APPLICATION ID:	201
APPLICATION PROMOTER:	BLC INC
PRODUCT SPECIFICATIONS:	
MARKET:	IMMEDIATE EXCHANGE
SUB-MARKET:	NONE
MARKET TYPE:	SPOT
ESTABLISHMENT DATE/TIME:	91.06.03.17.00.00.00
MATURITY DATE/TIME:	As soon as possible after transaction initiation
CONSIDERATION/ENTITLEMENT DENOMINATION TYPE:	MONEY
CURRENCY TYPE(IF APPLICABLE):	COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):	AUD and USD
MINIMUM PRODUCT DEFINITION VALUE:	Not Applicable
MAXIMUM PRODUCT DEFINITION VALUE:	Not Applicable
PRODUCT STEP VALUE:	Not Applicable

FIG. 80



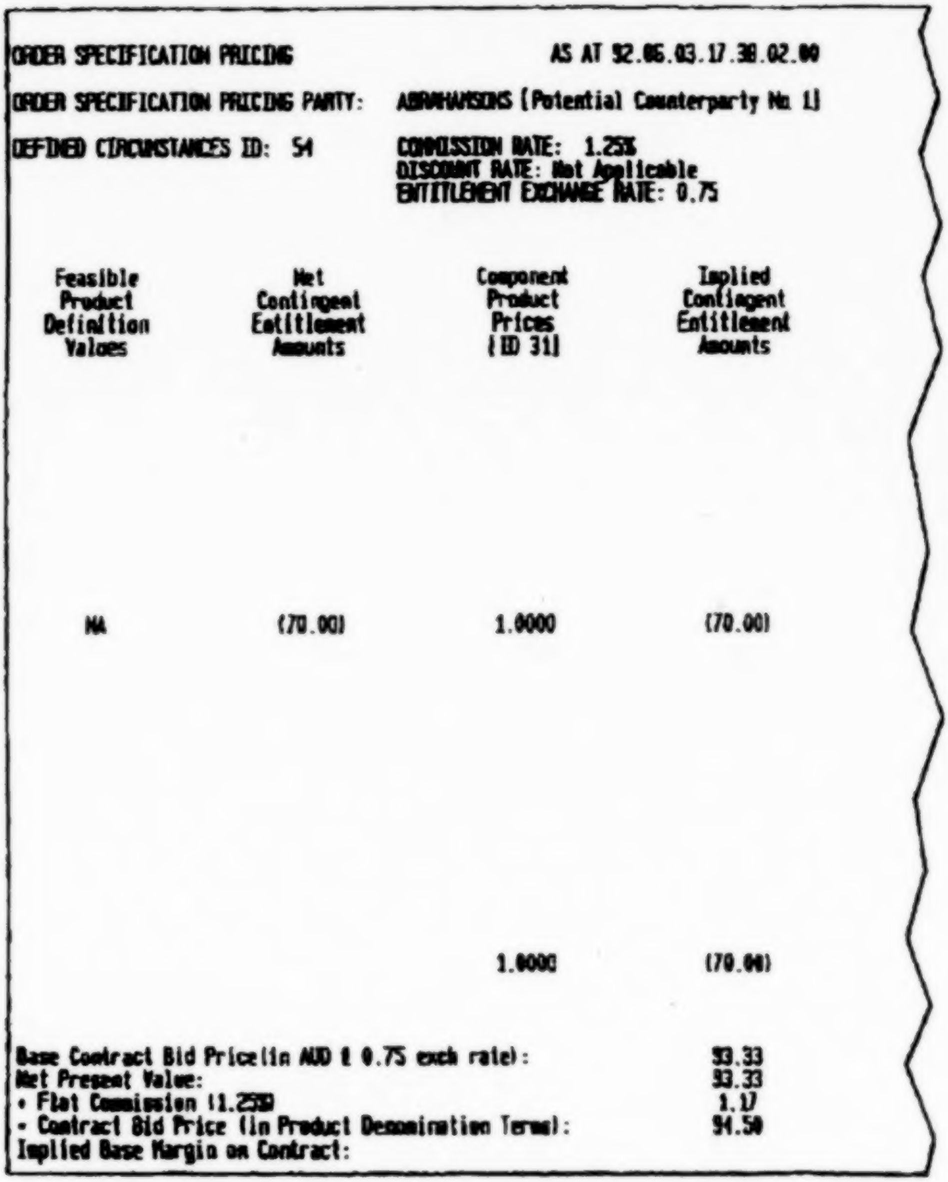
```
PRIMARY ORDER SPECIFICATION                                       AS AT 92.06.03.17.00.00.00

ORDERING PARTY:                        ABBOTTS & TAYLOR
ORDERING PARTY REFERENCE:              POZ 260

PRODUCT:
PRODUCT ID: 11099
MARKET: IMMEDIATE EXCHANGE                            SUB-MARKET: NONE            MARKET TYPE: SPOT
ESTABLISHMENT DATE/TIME:91.06.03.17.00.00.00                                      MATURITY DATE/TIME:As soon as possible after
                                                                                                     transaction initiation
ENTITLEMENT:
DENOMINATION TYPE:                                    MONEY
CURRENCY TYPE(IF APPLICABLE):                         COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):                USD
SPECIFIED ENTITLEMENT AMOUNT:                         70,000

CONSIDERATION:
DENOMINATION TYPE:                                    MONEY
CURRENCY TYPE(IF APPLICABLE):                         COMMERCIAL BANK DEPOSIT
NATIONAL CURRENCY TYPE(IF APPLICABLE):                AUD
MAXIMUM CONSIDERATION AMOUNT:                         102,900
```

FIG. 81A



ORDER SPECIFICATION PRICING AS AT 92.06.03.17.38.02.00

ORDER SPECIFICATION PRICING PARTY: ABRAHAMSONS (Potential Counterparty No 1)

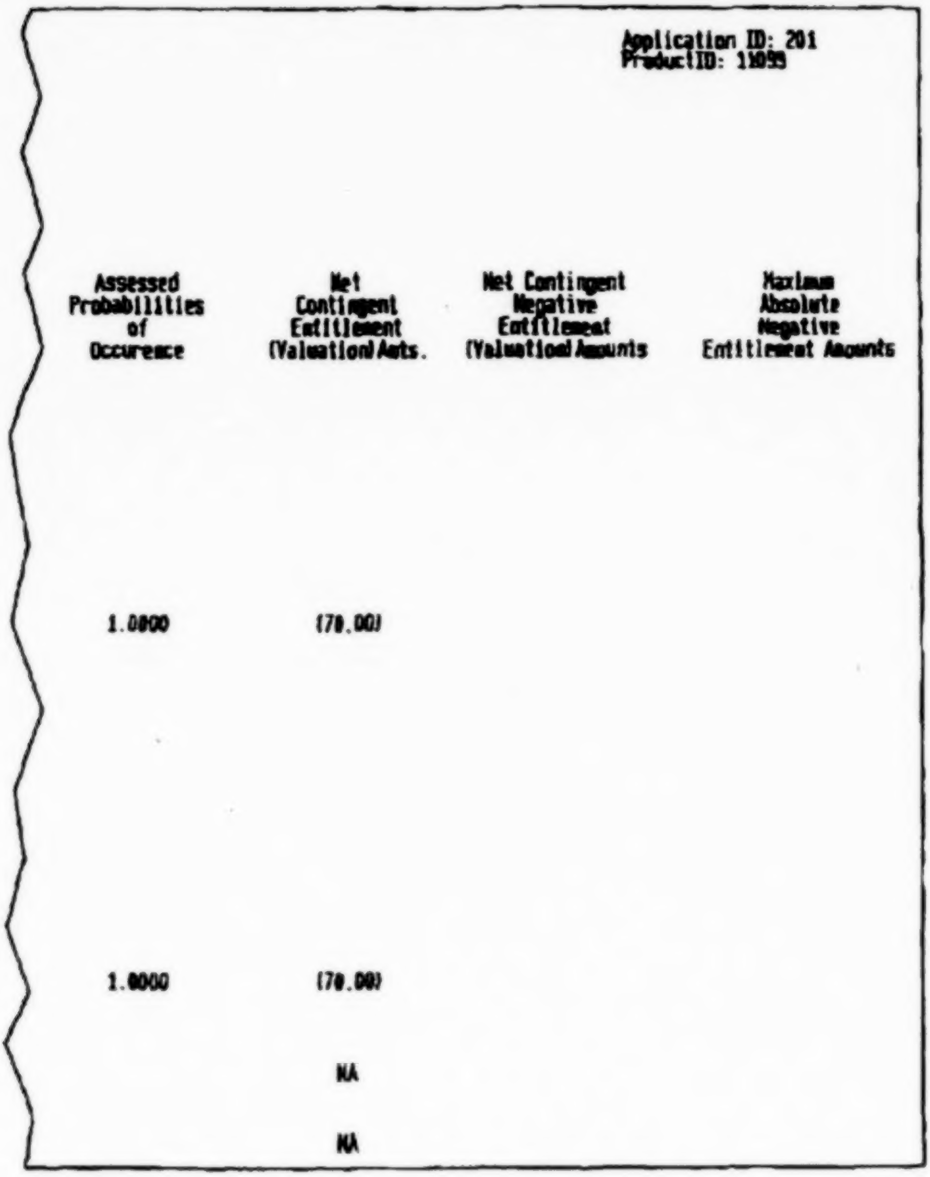
DEFINED CIRCUMSTANCES ID: 54

COMMISSION RATE: 1.25%
DISCOUNT RATE: Not Applicable
ENTITLEMENT EXCHANGE RATE: 0.75

Feasible Product Definition Values	Net Contingent Entitlement Amounts	Component Product Prices (ID 31)	Implied Contingent Entitlement Amounts
NA	(70.00)	1.0000	(70.00)
		1.0000	(70.00)

Base Contract Bid Price (in AUD @ 0.75 exch rate):	93.33
Net Present Value:	93.33
+ Flat Commission (1.25%)	1.17
= Contract Bid Price (in Product Denomination Terms):	94.50
Implied Base Margin on Contract:	

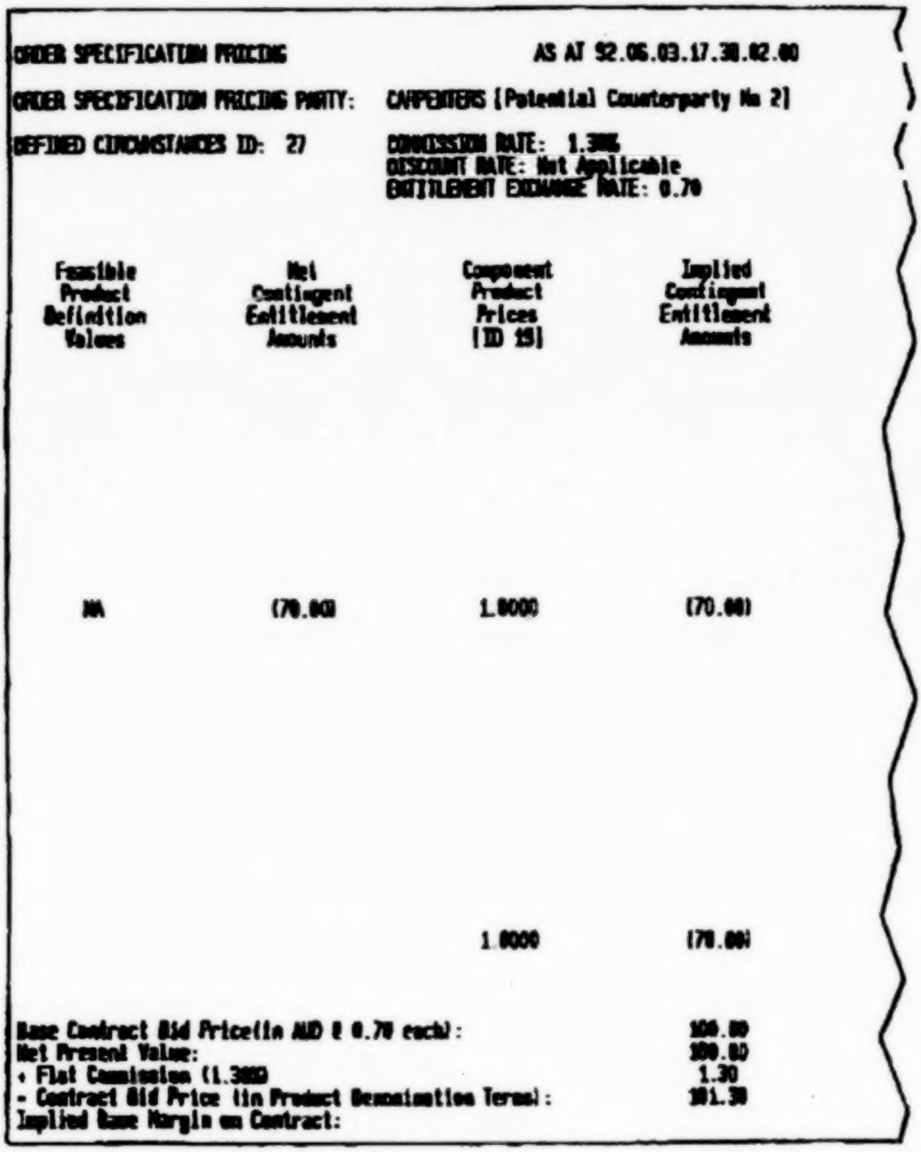
FIG. 81B



Application ID: 201
ProductID: 11099

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
1.0000	(70.00)		
1.0000	(70.00)		
	NA		
	NA		

FIG. 82A



ORDER SPECIFICATION PRICING AS AT 92.06.03.17.30.02.00

ORDER SPECIFICATION PRICING PARTY: CARPENTERS [Potential Counterparty No 2]

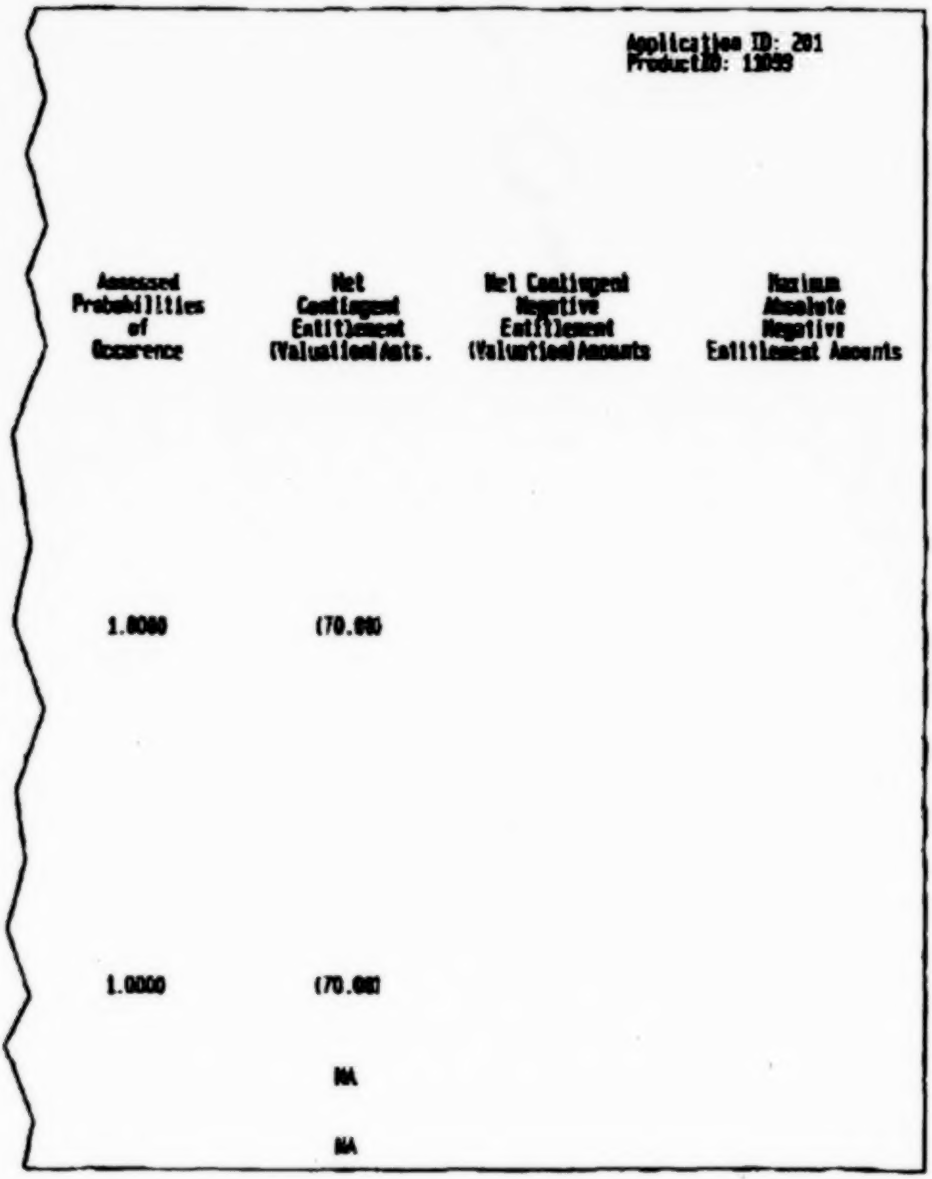
DEFINED CIRCUMSTANCES ID: 27

COMMISSION RATE: 1.30%
DISCOUNT RATE: Not Applicable
ENTITLEMENT EXCHANGE RATE: 0.70

Feasible Product Definition Values	Net Contingent Entitlement Amounts	Component Product Prices [ID 19]	Implied Contingent Entitlement Amounts
NA	(70.00)	1.0000	(70.00)
		1.0000	(70.00)

Base Contract Bid Price(in AUD @ 0.70 each):	100.00
Net Present Value:	100.00
+ Flat Commission (1.30%)	1.30
- Contract Bid Price (in Product Denomination Terms):	101.30
Implied Base Margin on Contract:	

FIG. 82B



Application ID: 201
ProductID: 13099

Assessed Probabilities of Occurence	Net Contingent Entitlement (Valuation) Amts.	Net Contingent Negative Entitlement (Valuation) Amounts	Maximum Absolute Negative Entitlement Amounts
1.0000	(70.00		
1.0000	(70.00		
	NA		
	NA		

SYSTEMS AND COMPUTER PROGRAM PRODUCTS FOR EXCHANGING AN OBLIGATION

This application is a continuation of the U.S. application Ser. No. 09/567,507, filed May 9, 2000, now U.S. Pat. No. 6,912,510, which is a continuation of U.S. application Ser. No. 08/870,691, filed Jun. 6, 1997, now U.S. Pat. No. 6,134,536, which is a Continuation-In-Part of U.S. application Ser. No. 08/070,136, filed May 28, 1993, now U.S. Pat. No. 5,970,479, and said U.S. application Ser. No. 08/870,691 is also a Continuation-In-Part of PCT/AU95/00827, filed Dec. 7, 1995. The patents and applications listed above are all incorporated by reference herein in their entireties.

TECHNICAL FIELD

This invention relates to methods and apparatus, including electrical computers and data processing systems applied to financial matters and risk management. In particular, the invention is concerned with the management of risk relating to specified, yet unknown, future events.

BACKGROUND ART

Individuals and enterprises are continually exposed to risk because of future events beyond their control. The outcome of those events can either positively or negatively impact on their wellbeing.

Individuals and enterprises should generally prefer not to face exposure to the possibility of adverse consequences, regardless of their perception of the likelihood of such events occurring. It is in their interest to consider foregoing 'resources' they currently possess if doing so would reduce the possibility of being so greatly exposed to future outcomes.

Risk can take many forms in view of the large range and type of future events which might result in adverse consequences. Risk can be categorised, in one instance, as 'economic' in nature. Phenomena that constitute economic risk include: commodity prices, currency exchange rates, interest rates, property prices, share prices, inflation rates, company performance, and market event based indices.

Another characterisation of risk concerns 'technical' phenomena. This can include things like the breakdown of an electricity generation plant, aircraft engine failure, and the damage to, or failure of, orbiting telecommunications satellites. The outcomes for each of these phenomena will be adverse for the users and/or supplier.

Other forms of risk defy ready characterisation, such as weather-based (viz., rain damage or lightning strike), or other natural occurrences (viz., earthquakes or iceberg collision with sea-going vessels).

There are also less tangible risks associated with, for example, the emission of atmospheric pollutants or the disposal of intractable toxic wastes, in the sense that the future consequences are unknown, save that there is a notion, based on current information, that they could be adverse.

The capability to manage risk is more important today than it was in the past, and is likely to become ever-more important into the future, because there is an ever increasing exposure to a wider generic range of future phenomena beyond the control of individuals or enterprises. There is also a wider feasible range of possible future events, and greater uncertainty about the likelihood of occurrence, associated with any single future phenomenon viz., an increasing volatility.

It is also thought that individuals are now more risk-averse in recessionary times, when there are fewer available discretionary resources to trade-off to protect themselves from such adverse future events.

In the prior art, individuals and enterprises faced with 'technical' risk have hedged against future outcomes by mechanisms such as the adoption of quality assurance practices, warranties, increased research and development activity (and associated intellectual property rights such as patents, utility models and registered designs), the purchase of modernised plant and equipment, and improved inventory, occupational health and safety and employer/employee relations practices.

Consider a manufacturer of, say, integrated circuits (ICs), which has many clients wishing to purchase its ICs. The demand may result in a delay in delivery due to limited manufacturing capacity, thereby requiring advance production scheduling for orders already in-hand. Typically, the manufacturer will give a warranty to a purchaser as to measurable performance criteria for its ICs; if a batch does not perform to the specified criteria, the manufacturer is required by contract to replace that batch. That is, a purchaser may have no interest in obtaining monetary compensation for the poor quality ICs, as the purchaser needs the components for their own products. In that case, the 'consideration' the warranty makes is the priority scheduling of a substitute batch of that type of IC, possibly displacing other scheduled production runs, or deferring delivery to another purchaser.

Such contractual arrangements are piece-meal in nature, and can only be struck between the manufacturer and each individual purchaser. They also leave the manufacturer exposed to claims from other customers whose orders are delayed by the rescheduling. The manufacturer has no convenient mechanism available to it to hedge against such claims, perhaps by way of reserving production rights with another manufacturer, in lieu of unavailability of their own manufacturing facility.

In the face of such 'economic' risk, it is known for individuals and enterprises to hedge against adverse outcomes by indirect means such as self-insurance, and directly by means such as futures contracts, forward contracts, and swaps.

There are disadvantages or limitations associated with such available economic risk management mechanisms. Particularly, they provide, at best, only indirect approaches to dealing with the risk management needs. The available mechanisms are relatively expensive, and provide limited phenomenon coverage, and therefore cannot meet the requirements of the party seeking to hedge against such wide-ranging future risk. The infrastructure and pay-out costs associated with switching between, say, a commodities market and a stock market are often prohibitive for entities small and large alike. As a consequence, entities find themselves saddled with obligations they have little control over and cannot escape.

In respect of the "less tangible" forms of risk, an example in the prior art of a form of management of that risk is that of 'pollution rights' sold by the U.S. Environmental Protection Agency (EPA) in March 1993 for the atmospheric emission of sulphur dioxide. This was done by an auction of "allowances" permitting the release into the atmosphere. By the year 1995, any company or organisation emitting sulphur dioxide in the U.S. without enough allowances to cover their total emissions will face prosecution. This means polluters must either buy further allowances, or else modify or replace their plant and equipment to reduce these emissions. The EPA will regulate the total number of allowances able to be obtained. The existing allowances have already become a valuable tradeable 'property' as between sulphur dioxide emitters, that is, even before the time when no further allowances will be able to be purchased.

Management techniques for the "less tangible" forms of risk are in their infancy. The existing forms indicate an emerging demand for systems and methods to enable effective management.

Specific examples in the prior art of patents relating to methods and apparatus which deal with various forms of risk management include British Patent No. 2 180 380, in the name of Merrill Lynch Pierce Fenner and Smith Incorporated, directed to an Automated Securities Trading Apparatus (corresponding to U.S. Pat. No. 4,674,004, and further related to U.S. Pat. Nos. 4,346,442 and 4,376,978). Other examples include U.S. Pat. No. 4,739,478 assigned to Lazard Freres and Co., directed to Methods and Apparatus for Restructuring Debt Obligations, U.S. Pat. No. 4,751,640 assigned to Citibank, N.A., directed to An Automated Investment System, and U.S. Pat. Nos. 4,752,877, 4,722,055, and 4,839,804 assigned to College Savings Bank directed to Methods and Apparatus for Funding Future Liability of Uncertain Cost.

The present invention comes about in view of the shortcomings of existing risk management mechanisms, and the perceived increasing importance of the management of risk relating to specified, yet unknown, future events.

In this sense, the invention is directed to something having economic value to individuals, enterprises and societies as a whole. Methods and apparatus that provide for the management of risk offer material advantages by, for example, minimising adverse future outcomes, providing both a form of compensation in the event of adverse future outcomes, and forms of risk management not otherwise supported or available in the prior art, and thus have value in the field of economic endeavour.

DISCLOSURE OF THE INVENTION

The invention encompasses methods and apparatus enabling the management of risk relating to specified, yet unknown, future events by enabling entities (parties) to reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent on the occurrence of the specified future events. The entities submit such orders to a 'system' which seeks to price and match the most appropriate counter-party, whereupon matched contracts are appropriately processed through to their maturity.

Therefore, the invention enables parties to manage perceived risk in respect of known, yet non-predictable, possible future events. These future events may relate to measurable phenomena whose outcome is verifiable, and cannot be materially influenced by any other entity having a stake in that outcome.

The ability to price and match risk aversion contracts essentially comes about because of the nature of risk itself. Any number of people will each have differing views as to the likelihood of an outcome of some future event. This means that when each person is required to independently assess a range of outcomes for a specified future date, there almost always will be a variance in those assessments. Thus it is possible to match these expectations as between parties to form a contract. The potential counter-parties to an offered contract have the motivation of taking up an opportunity to exploit differing views of future outcomes to their advantage, either for some gain or, again, as a form of risk management.

It is important that the assessments as to future outcomes of events are made independently of any other party who could be a counter-party to a contract. The nature of the pricing and matching, therefore, is totally different to conventional negotiation or bidding as between parties.

The present invention enables entities to better manage risk, as they are able to think more explicitly about possible future events beyond their control which they perceive will have adverse consequences for them. They will have the capacity to utilise existing resources to reduce exposure to a specific risk, and have access to a generally available mechanism by which they can explicitly trade-off existing assets for increased certainty about the future. They are also free to decide upon the degree to which they should make such trade-offs, and to actually effect and subsequently manage such trade-offs in a simple and low cost manner.

Risk management contract formulation comprising the steps of order placement, pricing and matching. An ordering party initiates contract formulation by submitting an order that relates to a specified phenomenon that has a range of possible outcomes relative to a future date of maturity. The ordering party specifies elemental entitlements (pay-outs) due at maturity relative to the phenomenon's actual outcome, and a maximum consideration to be paid to a counterparty on matching of a contract. Independently, potential counterparties have submitted registering data based on their assessed probability of each possible outcome at maturity for the phenomenon in question. From this counterparty registering data, a data processing system then seeks to price each counterparty against the ordering party's specified entitlement. Broadly speaking, this involves multiplying each of the elemental ordering party entitlements with the corresponding counterparty probability and summing the results to derive counter considerations. The counter considerations must fall below the ordering party's maximum consideration for there to be the possibility of a match. Most usually a match will be made between the ordering party and the counterparty having the lowest counter consideration.

The ordering stakeholders and counter-party stakeholders can be considered to be contract buyers and contract sellers respectively. The entitlement for each outcome can be in the form of ' money' payoffs (both positive and negative) at maturity of a matched contract, or can be other types of compensation, possibly in the form of goods, services, promises, credits or warrants. The consideration, whether buyer specified or seller calculated, can again be in the nature of a premium or payments, or can relate to other 'non-money' forms of property or obligations, typically transferable when a contract is matched, although possibly deferrable, until, and potentially beyond, the time of maturity.

In the period between the match of a contract and maturity the various buyers, sellers and other contract stakeholders can review any contract to which they are a party and seek to trade that contract to other parties by the pricing and matching procedure, or variations on the pricing and matching procedure. They would tend to do so if their view of the future outcome of the phenomenon, being the subject of the contract, had changed markedly, or as a means to minimise expected losses if some unforeseen adverse trend in the present day outcome of the phenomenon has occurred. As well as trading existing contracts, further contracts can be offered to 'lay off' or avert risk. Stakeholder parties can build up a portfolio of matched contracts and offered contracts, which are continually traded to obtain the best possible position at any time, and that position can be continually reviewed with time.

It is further possible for offered contracts to be based on the difference between phenomena, and so manage perceived risk as between the phenomena. Elemental contract phenomena can therefore be developed to meet the most particular needs of buyers and sellers, thus creating great flexibility.

In most instances the date of maturity will be predetermined by a 'product sponsor' stakeholder, who otherwise cannot be a buyer or seller of contracts they sponsor. Even so, it is conceivable that the date of maturity can be tied to a specified time from the instant a contract is matched. This may be appropriate where the time of maturity is in the near future, in which case offered contracts could otherwise remain unmatched following initial offer even up until the time of maturity.

Other stakeholders have executive roles in administration, guaranteeing the performance of buyers and seller, regulation, supervision and so on. In this way the number and types of buyers and sellers that can be considered in pricing and matching offered contracts can be controlled.

The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement.

In another preferred form, the invention provides that the phenomenon for an offered contract is specified such that the elemental entitlements for the range of outcomes are the same for each outcome. In mathematical terms this corresponds to a shape in an x-y Cartesian coordinate system where entitlement value (y) with respect to the outcome values (x) is a flat line. Put another way, the entitlement vs. outcome (y,x) shape has zero gradient (y/ x). This type of entitlement/outcome shape can be thought of as a form of lending (if the entitlement is positive, or borrowing if the entitlement is negative), in that the ordering party wishes to make the consideration available for lending now, having the expectation of receiving a known (non-contingent) entitlement in the future. Contract pricing and matching with a counterparty can proceed as described above.

Embodiments of the invention significantly advance the state-of-the-art of formulating and trading risk management contracts. Essentially, this is achieved by a computing/telecommunications infrastructure that is capable of being accessed worldwide by any enterprise/individual having access to a computer and telephone network. Furthermore, a virtually infinite number and range of risk typescan be accommodated. One embodiment presents itself in a form that assists users in making consideration-entitlement (insurance-type) trade-off decisions and provides a blind yet transparent price-discovery and trading process. Through its capability to create special case lending/borrowing and exchange products, end users are also provided with a low-cost mechanism for pricing and acquiring these products without the involvement of traditional intermediaries.

The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement. Therefore, in accordance with a further aspect of the invention, there is disclosed a method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of: (a) creating a shadow credit record and debit record for each party to be held independently from the exchange institutions by a supervisory institution; (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and debit record; (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusts each respective party's shadow credit record or debit record, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and (d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

BRIEF DESCRIPTION OF THE DRAWINGS

A number of embodiments of the invention will now be described with reference to the accompanying drawings, in which:

FIG. 1 shows a block diagram of a generic 'system' embodying the invention;

FIG. 2a shows a schematic block diagram of an indicative hardware platform supporting the system of FIG. 1;

FIG. 2b is a schematic block diagram of an alternate hardware platform supporting the system of FIG. 1;

FIG. 3 shows a representation of INVENTCO and its main component parts;

FIG. 4 shows a block diagram of a subset of the components of an INVENTCO system's markets-depository (M-INVENTCO);

FIG. 5 shows a block diagram of the process components of a subset of one type of 'market' (termed CONTRACT APP) which can reside within M-INVENTCO;

FIG. 6 shows a timeline applicable to Example I;

FIG. 7 shows a timeline applicable to Example II;

FIGS. 8 to 16 show flow diagrams of the contract pricing and matching methodology;

FIG. 17 shows a timeline applicable to Example III; and

FIGS. 18 to 40 show flow diagrams of the first to ninth process components for a CONTRACT APP; and

FIG. 41 shows a timeline for Example IV;

FIG. 42 shows a timeline for Example V; and

FIGS. 43A to 82B show tables and charts associated with Examples I, II, III, IV, and V.

DETAILED DESCRIPTION OF A BEST MODE FOR CARRYING OUT THE INVENTION

1. Introduction

The description firstly discusses the relation of the various users (stakeholders) of the 'system', followed by a consideration of a hardware data processing platform and peripheral input/output devices by which stakeholders interact with each other and the system.

This is followed by a discussion of the scope of the 'applications' that can be supported by the system in relation to the various stakeholders, and the interrelation of component parts thereof.

Details as to software methodologies for implementation of the applications supported by the system are also described, including a number of worked examples relating to the formulation and trading of risk management contracts.

In the course of the detailed description reference is made to a number of non-conventional expressions and terminologies. For convenience, an explanation of these is listed in the Glossary hereinbelow.

2. 'Systems' Configurations

FIG. 1 shows a block diagram of a generic 'system' embodying the invention. The various stakeholders or parties to the system 10 each have access to a centralised processing unit 20. The processing units 20 can be constituted by one or more data processing apparatus, with each one thereof providing access for any one or more of the various stakeholders to applications software supported by the system 10, as all the processing units would be interconnected. Access to the one or more data processing apparatus is controlled by a generic form of communications coordination and security processing unit 25.

FIG. 1 also indicates that there are a number of types of stakeholder, and a number of individual stakeholders within each stakeholder type. The basic types of stakeholder are described as: applications promoters 11, product sponsors 12, product ordering parties (buyers) 13, potential product counter-parties (sellers) 14, counter-party guarantors 15, regulators 16, consideration/entitlement transfer (' accounting') entities 17, and miscellaneous parties 18. The detailed roles of each of these stakeholders will be subsequently described in greater detail at a later time. The number of types of stakeholder represented in FIG. 1 is typically the largest that will be supported by the system 10.

An embodiment of a computer system for the system 10 is shown in FIG. 2. The core of the system hardware is a collection of data processing units. In the embodiment described, the processing unit 20 comprises three inter-linked data processors 93, 97, 104, such as the Sun 670 MP manufactured by Sun Microsystems, Inc, of the USA. Each processing unit 93, 97, 104 runs operational system software, such as Sun Microsystems OS 4.1.2, as well as applications software. The applications software is, in part, written around the flow diagrams subsequently described in FIGS. 8 to 16, and FIGS. 18 to 40, and accesses, or otherwise creates, the data files as summarized in the section headed PROCESS 2 VARIABLES ANT) DATA

FILES hereinbelow. The processor configuration shown in FIG. 1 represents a large system designed to handle the transactions of thousands of stakeholders, the input and output data generated by those stakeholders, and risk management contact pricing, matching and subsequent processing functions.

Each processing unit 93,97,104 is operably connected with it one or more mass data storage units 95, 100,110 to store all data received from stakeholders, and other data relating to all other software operations generating or retrieving stored information. Suitable mass storage units are, for example, such as those commercially available from Sun Microsystems.

A number of communications controllers 80,84,87 , forming the communications coordination and security processing unit 25, are coupled with the processing unit 20. These controllers effect communications between the processing units 93,97,104 and the various external hardware devices used by the stakeholders to communicate data or instructions to or from the processing units. The communications controllers are such as the Encore ANNEX II, the IBM AS/400 server or the CISCO Systems AGS+.

A large range of communications hardware products are supported, and collectively are referred to as the stakeholder input/output devices 70. One amongst many of the communication devices 70 are personal computers 51 and associated printers 52, which have communications connection with the communications controller 80 by means of a modem 50. There can also be an external host device 53, such as a mini or mainframe computer, again linked with the communications controller 80 by means of a modem

54. In other forms, communications can be established simply by means of a tone dialing telephone 56, which provides for the input of instructions or data by use of the tone dialing facility itself. In the alternative, a voice connection via an operator 75 can be effected by a conventional telephone 58. Both these external devices are shown connected with the communications controller 84. A further possibility is to have data transfer by means of a facsimile machine 65, in this case shown linked to the communications controller 87.

In all cases, users of the input devices are likely to be required to make use of system access password generation and encryption devices such as the Racal RG 500 Watchword Generator 66, 67,68,69, (for personal use) and the Racal RG 1000, which is incorporated in a mainframe computer 53. The corresponding decoding units for these devices are incorporated in the communications controllers 80,84,87.

The generic processing unit 20 also includes a large number of 'portable' information recordal devices, such as printers, disc drives, and the like, which allow various forms of information to be printed or otherwise written to storage media to be transferable. This is particularly appropriate where confirmatory documentation of matched risk contracts is required to be produced, either for safekeeping as a hard copy record, else to be forwarded to any one or more of the stakeholders that are a party to each individual matched contract.

The generic system 10 shown in FIG. 1 encompasses many varied configurations, relating not only to the number and types of stakeholders, but also the 'architectures' realisable by the system hardware and software in combination. In that sense the arrangement shown in FIG. 2a is to be considered only as broadly indicative of one type of hardware configuration that may be required to put the invention into effect.

For example, FIG. 2b shows an alternative configuration that does not rely upon a centralised (hub) data processing unit, rather the necessary processing is performed locally at each stakeholder site 200_n by means of distributed software.

The 'virtual' level of the system 10 is termed INVENTCO. INVENTCO is a collection of one or more potentially interrelated systems, as shown in FIG. 3. Each INVENTCO system (INVENTCO SYSTEM #1 . . . INVENTCO SYSTEM #N) enables the formulation and trading of a wide range of contractual obligations, including risk management contracts. The hardware configuration shown in FIG. 2, is to be understood both as a realisation for a single INVENTCO system, and equally can represent a number of INVENTCO SYSTEMS, where the processing unit 20 is common to all and supports a number of communications co-ordination and security units 25, others of which are not shown, together with associated external communications devices 70, also not shown.

While INVENTCO allows the formulation and trading of risk management contracts, it is also responsible for processing of such contracts through to, and including, their maturity, and in some respects, subsequent to maturity.

Where there are a number of INVENTCO systems, those systems may be inter-dependent or stand-alone in nature. If inter-dependent, INVENTCO (10) is responsible for transactions between those systems.

INVENTCO and all of its component parts can be legally or geographically domiciled in separate countries or states. The supra-national nature of INVENTCO enables the stakeholders to avail themselves of the risk management mechanisms independently of legal domicile or other such restrictions that are often a feature of some conventional risk management mechanisms, subject to meeting certain criteria regarding credit worthiness and such. Indeed, the legal domicile, location, ownership and participating stakeholders of INVENTCO, or any of the sub-systems, can be continually changing.

FIG. 3 further shows that each INVENTCO SYSTEM comprises an infrastructure component, termed I-INVENTCO, and a markets depository component M-INVENTCO. I-INVENTCO is concerned with coordination of communications and other security considerations, that part termed AXSCO, and also provides a network and general management system, termed VIRPRO. M-INVENTCO is a depository of authorised product-market (applications) software residing within INVENTCO under the authorisation of VIRPRO, and as distributed using I-INVENTCO.

One or more local or wide area telecommunication networks may link VIRPRO and M-INVENTCO to AXSCO, and thus to each other. In this way both VIRPRO and M-INVENTCO effectively reside around AXSCO.

AXSCO therefore comprises multiple, uniquely addressed communications controllers linked together in a number of possible ways. In one embodiment, AXSCO is represented by the communications coordination and security processing unit 25 shown in FIG. 2. The component hardware, such as the three controllers 80, 84,87 shown in FIG. 2, typically are responsible for three types of operational applications. The first is in respect of time stamping data received from other parts of INVENTCO and data similarly transmitted to entities external of INVENTCO. The second is in respect of protecting the identity and/or location of entities within INVENTCO from one another, and from entities external to INVENTCO. The third is responsible for overall management of the routing of data received and to be transmitted within INVENTCO and to external entities thereto.

Referring now to FIG. 4, within M-INVENTCO reside different collections of system sponsored phenomena or 'markets', one collection of which is termed CONTRACT APPS. Each CONTRACT APP within the CONTRACT APPS 'markets' collection is essentially related to a specific type of risk management phenomenon. The purpose of individual CONTRACT APPS is two-fold. First, to effect the trading/exchange/transfer of risk management contracts (and derivatives of these transactions) between participating product ordering parties and counter-parties on terms acceptable to the parties involved, as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trades/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through to their time of maturity.

Individual CONTRACT APPS are responsible for performing the above-described tasks according to the specific rules they embody, defined by their applicable stakeholders.

The role played by the various stakeholders to CONTRACT APPS, remembering that in many cases it would not be necessary to have the involvement of all the possible types of stakeholder, briefly stated is as follows:

(a) An application promoter is an entity having overall responsibility for the functioning of a CONTRACT APP, having being granted that responsibility by VIRPRO.

(b) A product sponsor is an entity which promotes and administers the rules of trading, and subsequent management of defined "products" selected for inclusion in a CONTRACT APP by its application promoter.

(c) An ordering party (buyer) is an entity seeking to acquire a CONTRACT APP product from a potential counter-party (seller).

(d) A counter-party (seller) is an entity potentially prepared to satisfy the CONTRACT APP product needs of an ordering party (buyer).

(e) A guarantor is an entity guaranteeing a seller's ability to settle or meet obligations as a result of a CONTRACT APP effected match.

(f) Regulators are entities overseeing the on-going performance of all other stakeholders involved in a CONTRACT APP, and especially guarantors.

(g) Consideration/entitlement transfer ('accounting') entities are those parties with which all other CONTRACT APP stakeholders maintain 'accounts' to transfer required considerations/entitlements to or from each other.

(h) Other miscellaneous parties are those having some other defined stake in the functioning of a CONTRACT APP. In any implementation of the system, multiple numbers of each form of stakeholder are accommodated. A detailed consideration of the nature of CONTRACT APPS and the types of stakeholders to a CONTRACT APP is given in the section headed CONTRACT APPS hereinbelow.

As shown in FIG. 5, any one CONTRACT APP consists of a cluster of nine (and potentially more, or fewer) specific processes, these include:

(a) a process handling file administration and updating tasks supporting all other processes (termed Process 1);

(b) a process handling the receipt and processing of "primary" risk aversion contract transactions (termed Process 2);

(c) a process handling the receipt and processing of "secondary" risk aversion contract transactions (termed Process 3);

(d) a process handling the receipt and processing of "derivative-primary" risk aversion contract transactions (termed Process 4);

(e) a process handling the receipt and processing of "derivative-secondary" risk aversion contract transactions (termed Process 5);

(f) a process handling the "back office" management of all four types of risk aversion contract transactions, and transactions handled by Processes 7 to 9 (termed Process 6);

(g) a process handling non-CONTRACT APP-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7);

(h) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to specialist systems to assist the stakeholder concerned to decide how best to interface with a defined element of INVENTCO (termed Process 8); and

(i) a process handling CONTRACT APP (and authorised other INVENTCO) stakeholder access to a range of INVENTCO-facilitated "value added services" (termed Process 9).

A detailed discussion of the nine CONTRACT APP processes is given in the section headed DESCRIPTION OF CONTRACT APP PROCESSES hereinbelow.

All these processes collectively access multiple data files and multiple records within these files. A description of the variables and data files used by Process 2, a key component process of a CONTRACT APP, is provided in the section headed PROCESS 2 VARIABLES AND DATA FILES hereinbelow.

The foregoing description identifies the essential inter-reaction between the hardware platform and the applications computer software run thereon.

A first example of the life-cycle of a risk management contract will now be described. A further detailed discussion of the nature of risk management contracts is given in the section headed RISK MANAGEMENT CONTRACTS hereinbelow.

3. Life Cycle of Risk Management Contract

Example I

The first example of a risk management contract describes a contract to manage risk associated with faults in microprocessors. In summary, the example shows how the system could enable one party, such as a supplier of military standard equipment seeking to avoid the adverse consequences of faulty microprocessors (specifically, 64-bit microprocessors) used in that equipment to make a contract with another party, such as a manufacturer of these microprocessors, who is seeking to exploit an opportunity based on their view of the future incidence of faults in the microprocessors they produce.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to "exclusive production warrants" (XPWs). That is, warrants providing the holder with priority access to a specified quantity of replacement and additional microprocessors sourced, immediately, from a defined, different, guaranteed high-quality, production line available to the supplier in consideration of payment of a money amount. The XPW entitlement is contingent on the value, at contract maturity date, of a percentage index of the proportion of 64-bit microprocessors shipped by the manufacturer, during a specified prior period, which are subsequently determined to be faulty to a defined degree. The defined degree, in this case, is the microprocessor being fault-free, as determined by successful completion of self-tests.

In this example, the relevant key stakeholders are: an application promoter (Demdata Inc); various product sponsors (the relevant one for the example being Demdata Inc itself); various primary product ordering parties (the relevant one for the example being Denisons); a single potential counterparty (Demdata Inc again); and an application regulator (the Department of Defence).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 6. FIGS. 43A-50B are eight detailed explanatory charts supporting FIG. 6. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 43A and 43B, it can be seen that Demdata Inc, established a Contract APP (Application ID100) on 92.02.10.17.00.00 (that is, in inverse order, 5 pm on Feb. 10, 1992) to deal with defect liability management. Application ID100 supports a range of products (Applicable Product ID's 1200-1250).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 44A and 44B, it can be seen that Demdata was also Product Sponsor of Product 1210 at the same time (92.02.10.17.00.00). This Product relates to the market termed: Factory Output Quality Indices, and to the sub-market termed 64-bit Microprocessor Fault Tolerance Index. The maturity date for Product 1210 is 95.02.10.17.00.00.00. The consideration for a specific contract involving Product 1210 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is in the form of Exclusive Product Warrants (XPWs); these entitle the contract ordering party to priority access over the forward production capacity of a defined, guaranteed-high-quality, 64-bit microprocessor production line. Product 1210 specifies a range of 0% to 100% in 2% increments in respect of the sub-market outcomes.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), it can be found that Demdata is acting as the sole potential counterparty for forthcoming primary product orders dealing with Product 1210. At this point in the timeline (93.07.01.14.00.00.00), 17 months after the specification of Product 1210, Demdata has currently-

specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with FIGS. 45A and 45B, it can be seen that an Ordering party, Denisons, is seeking a contract (from the offering party, Demdata) in Product 1210 at that time (93.07.01.14.25.30.00). FIGS. 45A and 45B show the specific "pay-off" parameters that Denisons has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration (premium) amount of 32,000 (denominated in commercial bank, Australian dollars).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 46A and 46B, it can be seen that Demdata (using the specified pricing parameters set at (93.07.01.14.00.00.00) prices the Denison order 93.07.01.15.26.40.00. Demdata's pricing parameters indicate that their appropriate Defined Circumstances ID for Denisons is 14. As is shown, this ID in turn implies a Commission Rate of 1.10%, a Discount Rate of 9.90%, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence over the range of feasible product values (outcomes).

The Contract Bid Price is calculated automatically by the application software in the following manner: The ordering party-specified desired contingent entitlement amounts, i.e. the "registered data", (covering the feasible product definition value range) are multiplied by the potential counterparty-specified component product prices (which will rarely add to "1" because each counterparty is endeavouring to 'game' potential ordering parties in different ways) to yield the corresponding number of implied contingent entitlement amounts. When added together, these figures sum to (34.110), where the brackets signify a negative value. This figure represents an expected future counterparty-entitlement payout amount (as at the designated contract maturity date of 95.02.10.17.00.00). The present day value of this figure, calculated using the specified discount rate of 9.90% per annum, is 29,220. To this amount is added the potential counterparty's desired flat commission amount of 1.10%, yielding a contract Bid Price (in the consideration/entitlement denomination of the product, commercial bank-denominated Australian dollars) of 29,540. No exchange rates are applicable in this case, because the ordering party, Denisons, is not seeking to deal in a consideration or entitlement denomination different to the denominations formally specified for the product. Demdata's parameters calculate that a consideration bid price of 29,540 will yield them a base margin on the contract of 3,180 (again denominated in commercial bank, Australian dollars).

This margin amount is calculated in the following manner: The ordering party-specified desired contingent entitlement amounts (covering the feasible product definition value range) are multiplied by the potential counterparty-specified assessed probabilities of occurrence to yield a corresponding number of net contingent entitlement valuation amounts. When added together, these sum to (30,770). This amount represents an expected future counterparty-entitlement loss-on the contract (as at the designated contract maturity date of 95.02.10.17.00.00). The present value of this amount, calculated using the specified discount rate of 9.90% per annum, is 26,360. Thus, (ignoring for this example the margin Demdata may gain from using, in some manner, the consideration amount of 29,540 through to the time the contract expires, and various transaction fees) the margin Demdata can expect from entering into this contract with Denisons is their calculated present-value indifference price of 29,540 less their calculated present-value expected loss on the contract of 26,360 (or 3,180).

The amounts in the last two rows of the table of FIGS. 46A and 46B are used for checking that this contract, if entered into by Demdata, will not result in them violating any self-imposed portfolio valuation or composition limits. This notion is explained in detail in Example III.

Looking at the sixth step in the timeline (Order Matching), it can be found that Demdata's contract bid price of 29,540 is below Denison's specified maximum consideration price of 32,000, leading to a matching of the order at 93.07.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be seen to take place twelve minutes later at 93.07.01.14.38.50.00, after the system has determined that Denisons is able to (and then does) immediately pay the required consideration funds amount of 29,540 to Demdata.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 47A and 47B, it can be seen that a contract valuation report for Denisons was published not much longer than one hour after confirmation of the contract, that is, at 93.07.01.16.00.00.00. As can be seen, the market estimate of the future product value of the 64BMFT Index at this moment is 38 (with a standard deviation of 4), which implies that this contract has an expected future value of 29,330 XPWs (with a standard deviation of 6,213).

On FIGS. 48A and 48B it can be seen the equivalent report for Demdata Inc. of their expected future entitlement payout is identical to Denisons' expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts). The above-described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The ninth step in the timeline (Contract Valuation) refers to a contract valuation report published for Denisons sixteen months later, at 94.11.15.10.00.00.00 (see FIGS. 49A and 49B). As can be seen, the market estimate of the future product value of the 64 BMFT Index at this moment is 58 (with a standard deviation of 5), which implies that this contract now has an expected future value of 42,160 XPWs (with a standard deviation of 6,209). This is an increase in expected future value of 12,830 XPWs for Denisons since the former valuation date/time.

The tenth step in the timeline, Contract Maturity, refers to the actual determination of the product value at time of maturity, 95.02.10.17.00.00.00. As can be seen on FIGS. 50A and 50B, this product value of the 64 BMFT Index was specified by Demdata (as Product Sponsor) to be 74, implying a contract value of 100,660 XPWs to Denisons and a corresponding obligation on Demdata. The amount of 74 represents the percentage of 64-bit microprocessors shipped by Demdata, during a specified period some time before the designated contract maturity date, which are subsequently determined (possibly by the application regulator, The Department of Defence) to be faulty.

The eleventh step in the timeline involves the formal assignment of 100,660 XPWs by Demdata to Denisons (ignoring possible fee payments by one or both parties).

4. Life Cycle of Risk Management Contract

Example II

The second example describes a risk management contract associated with the utilisation of telecommunications carrying capacity. In summary, the example shows how the system could enable one party (a telecommunications carrier) seeking to avoid the adverse consequences of under and over-committing their call carrying capacity between specified points (say, between the two cities, New York and Boston) to make a contract with another party (say, another telecommunications carrier with call carrying capacity between the same two cities) similarly prepared to hedge against the consequences of this occurring.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to transmission time units between the hours 1200-1800 daily on the NY-Boston link within a defined future period (termed, Prime TTU's) upon assignment by the ordering party—to the counterparty—of a calculated consideration amount of Prime TTUs on the ordering party's own NY-Boston line within another defined future period (these defined TTUs may or may not be convertible to TTUs on other city links). The TTU entitlement is contingent on the value, at contract maturity date, of the log of the difference between the ordering party's utilisation of the counterparty's network and the counterparty's utilisation of the ordering party's network, during a specified prior period ending on the contract maturity date.

In this example, the relevant key stakeholders are: an application promoter (Newcom Inc); various product sponsors (the relevant one for the example being Newcom Inc itself); various primary product ordering parties (the relevant one for the example being Basstel Co.); two potential counterparties (Tasnet and Aarcom); and an application regulator (ITT).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 7. FIGS. 51A-59B are nine detailed explanatory charts supporting FIG. 7. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 51A and 51B, it can be seen that Newcom Inc. established a Contract APP (Application ID 001) on 93.11.01.17.00.00 (that is, 5 pm on Nov. 1, 1993) to deal with hardware capacity management. Application ID 001 supports a range of products (Applicable Product ID's 2001-2020).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 52A and 52B, it can be seen that Newcom Inc. was also Product Sponsor of Product 2001 at the same time (93.11.01.17.00.00). This Product relates to the market termed Telecommunications Carrying Capacity and to the sub-market termed Prime TTUs. The maturity date for Product 2001 is 96.11.01.17.00.00.00. The consideration for a specific contract involving Product 2001 is in the form of "Ordering Party TTUs".

The entitlement is in the form of "Counterparty TTUs"; these entitle the contract ordering party to "transmission time units between the hours 1200-1800 daily on the NY-Boston link (within a defined future period)". The feasible values of PRIME TTUs are normalized in the range of -1.0 to +1.0, respectively signifying the proportionate utilization of respective networks as between the parties to a contract.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two other carriers, Tasnet and Aarcom, acting as potential counterparties for forthcoming primary product orders dealing with Product 2001. At this point in the timeline (94.06.01.14.00.00.00), 7 months after the specification of Product 2001, both Tasnet and Aarcom have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification) in conjunction with FIGS. 53A and 53B, it can be seen that an Ordering Party, Basstel Co., is seeking a contract, from an offering party, in Product 2001 at that time (94.06.01.14.25.30.00). FIGS. 53A and 53B show the specific parameters (entitlements) that Basstel Co. has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 58,000 (denominated in its own TTUs).

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 54A and 54B, it can be seen that Tasnet (using the specified pricing parameters set at 94.06.01.14.00.00.00) prices the Basstel Co. order at 94.06.01.14.26.40.00. Tasnet's pricing parameters indicate that their appropriate Defined Circumstances ID for Basstel Co. is 8. As is shown, this ID in turn implies a Commission Rate of 1.00%, a Discount Rate of 9.90% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example 1, this results in a Contract Bid Price of 55,180 (denominated in Basstel Co. TTUs), which Tasnet's parameters calculate will yield them a base margin on the contract of 10,760 (again denominated in Basstel Co. TTUs).

Still looking at the fifth step in the timeline, in conjunction with FIGS. 55A and 55B, it can be seen that Aarcom (again using the specified pricing parameters set at 94.06.01.14.00.00.00) also prices the Basstel Co. order at 94.06.01.14.26.40.00. Aarcom's pricing parameters indicate that their appropriate Defined Circumstances ID for Basstel Co. is 9. As is shown, this ID in turn implies a Commission Rate of 0.90%, a Discount Rate of 8.50% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results in a Contract Bid Price of 55,390 (denominated in Basstel Co. TTUs), which Aarcom' s parameters calculate will yield them a base margin on the contract of 9,430 (again denominated in Basstel Co. TTUs).

Looking at the sixth step in the timeline (Order Matching) it can be found that Tasnet's price bid of 55,180 is below Aarcom's bid of 55,390 and, in turn, that the 55,180 amount is below Basstel Co.'s specified maximum consideration price of 58,000. This leads to a formal matching of Basstel Co,'s order by Tasnet at 94.06.01.14.29.10.00.

The seventh step in the timeline (Order/Contract Confirmation) can be seen to take place nearly ten seconds later at 94.06.01.14.38.50.00, after the system has determined that Basstel Co. is able to (and then does) immediately assign the required consideration amount of 55,180 TTUs to Tasnet.

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 56A and 56B, one can see a contract valuation report for Basstel Co. published about two hours after confirmation of the contract, that is, at 94.06.01.16.00.00.00. As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet's network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.150) (with a standard deviation of 0.023), which implies that this contract has an expected future value of 54,236 Tasnet TTUs (with a standard deviation of 9,207). On FIGS. 57A and 57B one can see in the equivalent report for Tasnet that their required expected future entitlement payout is identical to Basstel Co.'s expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Contract Valuation) refers to a contract valuation report published for Basstel Co. five months later, at 94.11.22.10.00.00.00 (see FIGS. 58A and 58B). As can be seen, the market estimate of the future product value of the log of the difference between Basstel Co.'s utilization of Tasnet' s network and Tasnet's utilization of Basstel Co.'s network (during a specified prior period ending on the contract maturity date) at this moment is (0.400) (with a standard deviation of 0.010), which implies that this contract now has an expected future value of 350,181 Tasnet TTUs (with a standard deviation of 74,200).

This is an increase in expected future value of 295,945 TTUs for Basstel Co. since the former valuation date/time.

The tenth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 96.11.01.17.00.00.00. As can be seen on FIGS. 59A and 59B, this product value of TTU's was specified by Newcom Inc (as Product Sponsor) to be (0.400), unchanged from the prior valuation date/time, implying a contract value of 368,340 Tasnet TTUs to Basstel Co. and a corresponding obligation on Tasnet. The amount is higher than the prior valuation figure due to the actual determination figure being naturally without a standard deviation element.

The eleventh step in the timeline involves the formal assignment of the 368,340 TTUs by Tasnet to Basstel Co. (ignoring possible fee payments by one or both parties).

5. Primary Product Order Processing

Before describing the third, and most detailed, example, consideration will be given to the 'core' product (contact) ordering, pricing and matching processes. Note that expressions such as (PORD NEW) represent file names.

The flow charts in FIGS. 8 to 16 depict the processing flow of the matching system for primary product orders submitted by ordering party stakeholders to a CONTRACT APP, where this APP is based upon: an EV-CE counterparty pricing regime (assuming paid consideration amounts do not yield an income stream in their own right); a sequential order matching process; consideration/entitlement value dates which are immediately after a product sponsor-designated date/time; and matching rules which do three things: First, identify, for each ordering party's order, a counterparty offering the lowest price bid for an order, subject to this price being at or below the specified maximum price the ordering party has indicated it is prepared to pay. Second, accommodate portfolio expected loss constraints on an 'equivalent maturity date products', 'same-month maturity products', and 'all-products' basis. And third, apply the above-described matching rules on a pre-tax basis, with partial matching of product orders, and without conditional order matching rules.

As shown in FIG. 8, starting at block 610, and proceeding to block 625, the system determines which set of orders to process, authorises these orders, matches them with counterparties where possible, and then confirms them. As shown in blocks 1010 to 1070 in FIG. 9, the system holds newly submitted orders (PORD NEW), and all previously submitted, but as yet unmatched, orders which are defined as queued orders (PORD QUEUE). Parameters and algorithms can be implemented to give the system the ability to determine whether new or queued orders are to be processed at any time. For example, a simplistic algorithm would be to alternate between PORD NEW and PORD QUEUE one order at a time. Another example would be to load queued orders only when there is a change in the counterparty parameters. Test 1020 checks the decision made in block 1010.

For new orders, the system moves to block 1030. Details of the next recorded new order are loaded from the PORD NEW master file (block 1040). The order data fields include: the ordering party identification (BID); the ordering party's own reference (BREF); the product identification (PID) specified by the ordering party; the entitlement "payoff" function type (PAYFUNC); the parameters for the entitlement "pay off" function (PAYPARAM); a "deal type" identifier (DTID); the anonymous and manual deal identifiers (OANON and OMANUAL); the order retention time limit (RET LIM); the maximum consideration the ordering party is prepared to pay (MAXCONSID); the number of the account from which the consideration is to be "paid" (ACC CONSID); and the number of the account to which any entitlement "pay off" amount is to be paid (ACC ENTITL). With this information set, the system's next step is to authorise the order. This occurs at block 1050.

Order Authorisation

Blocks 1100 to 1162 in FIG. 10 provide an expansion of block 1050. Starting at block 1100 the order is assigned a unique identification, which is set in the order data field OID. Before verifying the order, additional information is required by the system. At block 1110, details of the product (order data field PID) are loaded from the master file PPRODUCT (block 1120). The information includes the product maturity date (PMAT); the product consideration/entitlement denomination (PC/ED); the product currency denomination (PCUR) and national currency denomination (PNCUR); and the product limits and parameters (PMIN, PMAX, and PSTEP). The test 1130 checks that the order parameters are consistent with the master file parameters implied by the defined product identification (PID). Orders which fail this test are rejected at block 1140, with details of these orders being stored in the master file PORD REJ (block 1150). In turn, the ordering party is informed of this event (block 1160). Processing then returns to the start of the flow chart (block 1010), ready to load the next order. When an order is authorised, processing continues at block 640.

In the case of a queued order being loaded (block 1060), the order fields are set using the details stored in the queue file PORD. QUEUE (block 1070). This data is a combination of new order data (as described in block 1030) and the data loaded/set when the order was originally verified (block 1110). Authorised order processing continues with the order matching process at block 640.

Order Matching

Blocks 1200 to 1616 in FIGS. 11 to 15 provide an explanation of block 640. Orders have retention time limits, stored in the order variable RET LIM. Test 1200 checks that the order retention time has not expired. If it has, the order is rejected at block 1210, with the order details copied to the rejected order file (PORD REJ). The ordering party is then informed of the rejection at block 1230, and processing returns to the main loop via connector "A". If the order is still valid, the order matching process proceeds. The aim now is to find a suitable counterparty (or counterparties) who "prices" the ordering party's "entitlement function" within the limits set by the ordering party. Starting at block 1240, the matching process described is one which seeks to identify, for each ordering party's order, a counterparty offering the lowest "price bid" for an order subject to this price being at or below the specified maximum "price" the ordering party has indicated it is prepared to pay.

Blocks 1300 to 1370 in FIG. 12 provide an explanation of block 1240. The first step is to narrow down a group of counterparties prepared to at least deal with the ordering party. This is described as obtaining the available counterparty short list. First the counterparty short list is wiped (block 1300). Next, the order data fields BID (ordering part identification) and PID (product identification) are used to search the PDEAL LIST master file (block 1320) for all counterparties prepared to consider dealing with the ordering party in the specified product. Any stakeholders who have set a MANUAL or ANON flag are also loaded. For each counterparty selected, SID is set to the corresponding identification. Test 1330 commences a loop which allows every counterparty available to be dealt with in turn. For any currently selected counterparty (with identification set in SID), the data flow proceeds to test 1365. Where the order data field OANON has been set by the ordering party and some stakeholder requires manual confirmation (MANUAL (SID)), the current potential counterparty is not included in the short list. Likewise if the ordering party set OMANUAL and some other stakeholder required anonymity (ANON (SID)). In both cases, data flow returns to test 1330. Otherwise, flow continues at block 1335. At this point, the system determines the applicable "defined circumstances" for the order. It uses the order data fields currently loaded and parameters set in the PSEL DC masterfile (block 1336) to determine this. At block 1340, pricing parameters including consideration/ entitlement exchange rates (if applicable), commission rates, and discount rates are selected from the PSEL PRICE master file (block 1350). Using the "defined circumstances" identification (set in DCID) all potential counterparties can have different sets of pricing parameters specified based on any of the order data fields of each order. Test 1360 checks that all the necessary parameters have been found. It is possible that the counterparty, though prepared to deal with the ordering party, does not have a complete set of pricing parameters for the current order specifications. Such a counterparty is not included in the counterparty short list, and processing returns to test 1330. At block 1370, the counterparty is added to the counterparty short list by including the pricing details in the variables: PRICEFUNC(SID), CR(SID), DR(SID), C-C/EDXCHANG(SID), C-CXCHANG(SID), C-NCXCHANG(SID), E-C/EDEXCHANG(SID), E-CXCHANG$ID), E-NCXCHANG(SID), MANUAL(SID), and ANON(SID). Processing then returns to test 1330 where the next selected potential counterparty is dealt with. When all selected potential counterparties have been processed, program flow returns to block 1250. At this point a potential counterparty short list has been obtained.

Blocks 1400 to 1550 in FIGS. 13 and 14 depict block 1250 in more detail, where every potential counterparty has its price offer calculated, based on their individual pricing parameters, for the currently loaded order. At block 1400 a loop commences allowing each potential counterparty in the potential counterparty shortlist to be dealt with in turn. SID is set to the identification of the counterparty currently selected. Test 1410 checks whether any counterparties are left for processing. At block 1420, the potential counterparty's price bid is calculated. Blocks 1490 to 1550 describe this calculation in more detail. At block 1490 the variable, INDEX, is assigned the starting value of the product value range (PMIN). Also, "price" is initialised to zero. Test 1500 commences a loop, where every index point in the product range is traversed. Block 1520 calculates the pricing value returned by the potential counterparty's pricing function, PRICEFUNC, as stored in (PRICEFUNC (SID)), at the current index point, and stores the value in P1. Block 1530 determines the pay-off amount required by the ordering party at the current index point and stores this value in P2. At block 1540, the total price at the current index point is calculated by multiplying P1 by P2. This value is added to the running total stored in PRICE(SID). At block 1550, the index counter (INDEX) is incremented by the product step size (PSTEP), and flow returns to the test 1500. When the end of the product range has been reached (PMAX), flow proceeds to block 1510, where the calculated price bid is modified by the following calculation:

PRICE(SID)=PRICE(SID)*E–C/EDXCHANG(SID)
E–CXCHANG(SID) E–NCXCHANG(SID).

Returning to block 1430, the price bid stored in PRICE(SID) will be in the applicable product's consideration/entitlement denomination, currency denomination, and national currency denomination. The following steps (block 1430-1470) determine and apply the applicable discount rate to the calculated price bid (currently in future value terms) to yield a price bid in present value terms. This is done as follows: At block 1430 the number of days to product maturity is determined. Block 1440 initialises the loop counter and discount rate divisor. For each day (or appropriate part thereof) between the current date/time and the product maturity date/time, the divisor is changed according to the formula (block 1460):

DIV=DIV*(1+((DR(SID)/100)/365))

At block 1470, the price bid is adjusted according to the formula:

PRICE(SID)=PRICE(SID)/DIV

Once the price bid in present value terms is known, the potential counterparty's defined commission is added to the price (block 1480). Given that CR(SID) is a percentage commission rate, the formula is:

$$PRICE(SID)=PRICE(SID)+CR(SID)/100)*PRICE(SID))$$

When test 1410 confirms that every potential counterparty has been priced, program flow continues at 1255.

The test at 1255 checks whether the order was a "quote only" order. If so, flow continues at block 1256 where one or more of the counterparty bid prices are selected. At block 1230, the ordering party is informed of the pricing information gathered. If the order was not a quote order (that is, it was a real product order), an attempt is now made to identify a counterparty from the potential counterparty short list matching the requirements of the current order. This is done at block 1260. Blocks 1560 to 1616 in FIG. 15 describe this process in detail.

Starting at test 1560, a check is made to ensure the potential counterparty shortlist is not empty. If it is, no match is possible and flow continues at block 1612. At this point SID is assigned "0" to indicate that no counterparty was selected from the potential counterparty short list, before moving to block 1614 where the entire order (as no part was matched) is queued. When the list is not empty, program flow continues at block 1570, where the lowest priced counterparty is selected from the counterparty short list. This determination is done based upon each potential counterparty's bid price (PRICE(SID)), being converted to the consideration/entitlement type, currency, and national currency consideration "payment" denominations sought by the ordering party (that is, PRICE(SID)= PRICE(SID)*C-C/EDXCHANG (SID)*C-CXCHANG(SID)*C-NCXCHANG(SID)). The counterparty identification is stored in SID, and its price offer is stored in BPRICE. At block 1580, the following check is made:

BPRICE>MAXCONSID

If the selected price is greater than the ordering party's specified maximum consideration payment (MAXCONSID) limit, a match with the current potential counterparty is not deemed possible. This must also be true for any of the remaining counterparties in the counterparty short list. This part of the matching process returns without any potential counterparty in the short list having been selected for a match (block 1612). Otherwise, the current price is acceptable, and the process proceeds to attempt a match with the current selected counterparty.

The next step (block 1590), requires all the applicable contract, product, and portfolio absolute loss, expected loss, expected value limits, and maximum composition limits to be read from the PSEL LIMIT master file (block 1600) and stored in ALL1(SID), ALL2(SID), ELL1(SID), ELL2(SID), ELL3(SID), ELL4(SID), ELL5(SID), EVL1(SID), MC(SID) and MCC(SID). The current absolute and expected losses accumulated are also read and stored in CAL2(SID), CEL2(SID), CEL3(SID), CEL4(SID), and CEL5(SID). The ELFUNC(SID) and EVFUNC (SID) values are also set for use when calculating the expected loss and expected value for the current order. Block 1602 calculates the price of the order entitlement function using the counterparty product expected loss and expected value parameters ELFUNC(SID) and EVFUNC(SID). The order's expected loss is stored in EL(SID); the order's expected value is stored in EV(SID). The absolute loss function is also determined at block 1602 and it is stored in AL(SID). Proceeding to block 1604, the portion of the order which will not violate the counterparty limits is calculated. This check is made at test 1606. If no part of the order is matched, process flow continues at block 1608. The potential counterparty is removed from the counterparty shortlist.

If some portion of the order is matched with the current counterparty, processing continues at block 1610. Here the SID is set to the identification of the matching counterparty. The unmatched portion (if any) is stored at block 1614 as a new order in the PORD QUEUE masterfile (block 1616). Flow then returns to test 1261 in FIG. 11. When a match occurs, program flow returns to block 650. The matched order must now be confirmed by carrying out a number of additional steps, as shown in FIG. 16, blocks 1620 to 1641. If no match occurred, processing of the current order steps, and program flow returns to the beginning via connector "A". The system is ready to load the next available order.

Matched Order Confirmation

For matched orders to become a contract, a number of additional actions are required. First, at test 1620, a check for manual authorisation is made. If required, program flow moves to block 1621 where authorisation requests are sent to the relevant stakeholders. Block 1623 then tests the replies for any rejections. If one or more rejections were received, program flow continues at block 1627 where the order is rejected. Otherwise, flow continues at 1624. Block 1624 effects the consideration payment by creating transactions in the payment shadow file (PAYACC SHADOW—block 1625). However, this may fail if the accounts specified do not exist or if at least the required consideration amount is shown not to be available. Test 1626 checks that "consideration payment" was effected successfully. If "consideration payment" fails, the matched order is rejected (block 1627), with details stored in the rejected order master file, PORD REJ (block 1628). The ordering party is then informed of this event at block 1640.

With successful payment, program flow proceeds to block 1630 where the is counterparty's current accumulated absolute and expected loss figures are updated (masterfile PSEL LIMIT—block 1631). At block 1632, the order data field OPRICE is set to the price given by the counterparty PRICE(SID), and SPRICE set to the counterparty's identification, SID. At block 1634, the matched order is certified as confirmed, with full details recorded in the masterfile PORD CONF (block 1636). The next step, block 1638, reports details of the newly created contingent contract to all stakeholders concerned. Program flow then returns to the beginning, via connector "A". The system is now ready to start processing the next order submitted by a specified ordering party.

6. Life Cycle of Risk Management Contract

Example III

The third example of a risk management contract describes a contract to manage risk associated with potential future movements in the value of a specified index of share prices (termed the PTSE 75 index). In summary, the example shows how the system could enable one party (such as an institutional fund manager) seeking to avoid the adverse consequences of a significant decline in the future value of the PTSE 75 index (specifically a decline by June 1996, relative to the assumed current (June 1991) value of the index) to make a contract with another, as-yet-unknown, party, such as another fund manager seeking to avoid the adverse consequences of a significant corresponding increase in PTSE 75 index value.

The specific offering is one which provides a contract ordering party with a specified contingent entitlement to a compensatory Australian dollar future payout upon payment of a calculated up-front consideration money amount by the ordering party to the as-yet-unknown counterparty. The future money entitlement is contingent on the value, at contract maturity date, of the independently-determined value of the PTSE 75 index.

In this example, the relevant key stakeholders are: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself); various product ordering parties (the relevant ones for the example being Abbotts & Taylor and Shearer & Associates); various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc); a counterparty guarantor (CNZ Banking Corporation); and an application regulator (the Pacific Central Bank).

The timeline depicting the steps in the contract from the first step (Application Specification) to the final step (Contract Settlement) is shown in FIG. 17. FIGS. 60A to 72B are thirteen detailed explanatory charts supporting FIG. 17. They should be read together with the following description.

Looking at the first step in the timeline (Application Specification) in conjunction with FIGS. 60A and 60B, it can be seen that BLC Inc established a Contract

APP (Application ID 001) on 91.06.03.17.00.00 (that is, 5 pm on Jun. 3, 1991) to deal with economic risk management. Application ID 001 supports a range of products (Applicable Product ID's 10020-11400).

Looking at the second step in the timeline (Product Specification) in conjunction with FIGS. 61A and 61B, it can be seen that BLC Inc was also Product Sponsor of Product 10061 at the same time (91.06.03.17.00.00). This Product relates to the Market termed Stock Indices and to the Sub-market termed PTSE 75. The maturity date for Product 10061 is 94.06.03.17.00.00.00. The consideration for a specific contract involving Product 10061 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is also in the form of commercial bank deposits denominated in Australian dollars, payable (if necessary) immediately after the Product's specified maturity date/time.

Looking at the third step in the timeline (Potential Counterparty Product Pricing Specifications), one can find two entities, Abrahamsons and Carpenters Inc, acting as potential counterparties for forthcoming primary product orders dealing with Product 10061. At this point in the timeline (95.01.01.17.00.00.00), 19 months after the specification of Product 10061, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline (Primary Order Specification), in conjunction with FIGS. 62A and 62B, it can be seen that an Ordering Party, Abbotts & Taylor, is seeking a contract, from an offering party, in Product 10061 at that time (95.01.01.17.37.06.00). FIGS. 62A and 62B show the specific parameters (entitlement) that Abbotts &

Taylor has defined for the contract it is seeking at this time, including a maximum acceptable contract consideration amount of 54,000 (denominated in commercial bank, Australian dollars).

In order to provide a more detailed explanation of the following fifth to seventh steps in the timeline, selected processing block numbers from FIGS. 8-16 will be referred to in brackets as follows: "[ ]".

Looking at the fifth step in the timeline (Order Specification Pricing) in conjunction with FIGS. 63A and 63B, it can be seen that Abrahamsons' specified pricing parameters, as set at 95.01.01.17.37.06.06 are used to price the Abbotts & Taylor order at 95.01.01.17.38.02.00. Abrahamsons' pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 26. As is shown, this ID in turn implies a Commission Rate of 1.25%, a Discount Rate of 10.00% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. In a similar process to that described for Example 1, this results in a Contract Bid Price of 51,920 (denominated in commercial bank, Australian dollars), which Abrahamsons' parameters calculate will yield them a base margin on the contract of 4,580 (again denominated in commercial bank, Australian dollars).

Still looking at the fifth step in the timeline, in conjunction with FIGS. 64A and 64B, it can be seen that Carpenters Inc specified pricing parameters, as set at 95.01.01.17.37.06.00, are also used to price the Abbotts & Taylor order at 95.01.01.17.38.02.00. Carpenters Inc's pricing parameters indicate that their appropriate Defined Circumstances ID for Abbotts & Taylor is 17. As is shown, this ID in turn implies a Commission Rate of 1.30%, a Discount Rate of 9.80% per annum, a particular set of Component product prices and a particular set of Assessed Probabilities of Occurrence. This results in a Contract Bid Price of 53,050 (denominated in commercial bank, Australian dollars), which Carpenters Inc's parameters calculate will yield them a base margin on the contract of 5,610 (again denominated in commercial bank, Australian dollars).

Again, still looking at the fifth step in the timeline, in conjunction with FIGS. 65A and 65B, it can be seen that Abrahamsons' pricing-related parameters (also set at 95.01.01.17.37.06.00) for determining the acceptability of ordered-contracts on the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are satisfied by Abbotts & Taylor's order. From Abrahamsons' perspective, this qualifies Abbotts & Taylor's order for inclusion in their product/contract portfolio, as long as Abrahamsons' consideration price bid turns out to be lower than Carpenters Inc's price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, in its order specification (FIGS. 62A and 62B), it is prepared to pay.

Finally, still looking at the fifth step in the timeline, but now in conjunction with FIGS. 66A and 66B, it can be seen that Carpenters Inc's pricing-related parameters (set at 95.01. 01.17.37.06.00) for determining the acceptability of ordered-contract oil the basis of their absolute loss, expected loss, expected value, and maximum portfolio composition attributes are also satisfied by Abbotts & Taylor's order. Now, from Carpenters Inc's perspective, this qualifies Abbotts & Taylor's order for inclusion in their product/contract portfolio, in this case, as long as

Carpenters Inc's consideration price bid turns out to be lower than Abrahamsons' price bid, and, in turn, this bid is below the maximum consideration price that Abbotts & Taylor has specified, in its order specification (FIGS. 62A and 62B), it is prepared to pay.

Looking at the sixth step in the timeline (Order Matching), it can be found that Abrahamsons' price bid of 51,920 is below Carpenters Inc's bid of 53,050 and, in turn, that the 51,920 amount is below Abbotts & Taylor's specified maximum consideration price of 54,000. This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons' at 95.01.01.17.38.07.00 [1260].

The seventh step in the timeline (Order/Contract Confirmation) takes place five seconds later at 95.01.01.17.38.11.00, after the system has determined that Abbotts & Taylor is able to (and then does) immediately pay the required consideration funds amount of 51,920 to Abrahamsons [650].

Looking at the eighth step in the timeline (Contract Valuation) in conjunction with FIGS. 67A and 67B, one can see a contract valuation report for Abbotts & Taylor published nearly six hours after confirmation of the contract, that is, at 95.01.01.23.00.00.00. As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1970 (with a standard deviation of 333), which implies that this contract has an expected future value of 53,000 commercial bank-denominated Australian dollars (with a standard deviation of 21,160). On FIGS. 68A and 68B one can see in the equivalent report for Abrahamsons that their required expected future entitlement payout is identical to Abbotts & Taylor's expected future entitlement receipt (ignoring future fee payments which may be netted against these payments/receipts).

The ninth step in the timeline (Secondary Order Specification), detailed on FIGS. 69A and 69B, occurs nearly six months after the above-described contract valuation event; that is, at 95.06.06.08.00.00.00. At this time, Abbotts & Taylor is seeking to sell its position in the contract which was matched/confirmed at 95.01.01.17.38.11.00 (and at that time assigned the Order ID of 9156515800 by the system) at a price better than 57,000. Shearer & Associates is prepared to pay 60,000 (commercial bank deposit-denominated Australian dollars) for this position. In all other respects the contract's attributes remain unchanged. On FIGS. 70A and 70B, the tenth step in the timeline, a contract sale is seen to have occurred at a price of 58,300, just below the above-described 60,000 upper limit purchase-price amount specified by Shearer & Associates. This amount is the current best estimate of the contract's expected future value, with the standard deviation of this expected future value calculated by the system, utilizing other recent transaction data, as being 10,610. Shearer & Associates has now formally taken the place of Abbotts & Taylor as a stakeholder to the contract.

The eleventh step in the timeline (Contract Valuation) refers to a contract valuation report published for Shearer & Associates seven months later, at 96.01.01.17.00.00.00 (see FIGS. 71A and 71B). As can be seen, the market estimate of the future product value of the PTSE 75 Index at this moment is 1800 (with a standard deviation of 283), which implies that this contract now has an expected future value of 162,360 commercial bank deposit-denominated Australian dollars (with a standard deviation of 35,160). This is an increase in expected future value of 104,060 for Shearer & Associates since the former valuation date/time. The above described market estimate of the future product value is determined by the system applying a defined composite of contract-counterparty assessed probabilities of occurrence figures drawn from the collection of all like contracts recently matched/confirmed by the system.

The twelfth step in the timeline (Contract Maturity) refers to the actual determination of the product value at time of maturity, 96.06.03.17.00.00.00. As can be seen on FIGS. 72A and 72B, this product value of the PTSE Index was specified by BLC Inc (as Product Sponsor) to be 1820, implying a contract value of 187,200 (commercial bank deposit-denominated Australian dollars) to Shearer & Associates, and a corresponding obligation on Abrahamsons. The figure of 1820 represents the actual value of the PTSE share price index at 96.06.03.17.00.00.00 as obtained by BLC Inc from the independently verifiable information source, the identity of which they would have disclosed at the time they first announced their sponsorship of trading in the PTSE 75 share index product.

The thirteenth step in the timeline involves the formal payment of 187,200 (commercial bank deposit-denominated Australian dollars) by Abrahamsons to Shearer & Associates (ignoring possible fee payments by one or both parties).

Life Cycle of Economic Management Contract

Example IV

This further example of a risk management contract is an extension of Example III. More particularly, however, it is a special case of the general case of Example III, in that for a particular phenomenon the same entitlement is specified by the ordering party for each of the possible outcomes. This is a case where X=1, <<alpha>>(X) is not applicable, <<beta>>(X)=the specified non-contingent entitlement (constant), and <<gamma>>(X)=11, where "11" denotes a mathematical shape that is a straightline with respect to the 'outcome' axis, drawn from a menu of such shapes. Put another way, the gradient of the graph of entitlement (y-axis) against outcome (x-axis) is zero.

The counterparty registering data remains the same as for Example III. It can be thought of as the scenario where the outcome is not of concern to the ordering party. When its future entitlement is positive, the contract, from the ordering party's view, is in the nature of a loan, in that the consideration is made available now for a future known entitlement. It is of course possible for the consideration and entitlement to be negative so that the nature of the contract from the ordering party's viewpoint is borrowing.

The example shows just this situation, in that one party (such as an institutional fund manager) seeks to avoid the adverse consequences of not having immediate possession of a defined resource (say, Australian dollars) by becoming a party to a contract with another, as-yet-unknown, party (such as another fund manager seeking to avoid the adverse consequences of being unable to adequately utilise the defined resource).

The specific contract offering is one which provides an ordering party with a specified non-contingent obligation (that is, a negative future entitlement) to make an Australian dollar future payout to the contract's counterparty upon that counterparty's payment of a calculated up-front consideration money amount to the ordering party.

Thus, for a given guaranteed entitlement payout amount by the ordering party to its counterparty on a contract's maturity date, the up-front consideration payment is essentially a function of two matters implicitly determined between the ordering party and the counterparty registering data:

1. The discount (interest) rate applicable to the contract (this will itself be credit risk-free Australian dollar instruments with the same maturity date, plus a margin reflecting the counterparty's assessment of the likelihood of default by the ordering party in making their required future entitlement payment in Australian dollars);
2. The counterparty's sought-after commission on the transaction.

Note that if, say, the contract entitlement is based in US dollars, the matter of the counterparty's defined forward Australian dollar/U.S. dollar exchange rate would also be relevant.

As noted, the relevant key stakeholders are the same as in Example III: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC Inc itself); various product ordering parties (the relevant ones for the example being Abbotts & Taylor and Shearer & Associates); various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc); a counterparty guarantor (CNZ Banking Corporation); and an application regulator (the Pacific Central Bank).

A timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 41 and further supported by FIGS. 73-77B.

Looking at the first step in the timeline, Application Specification, in conjunction with FIG. 73, we see that BLC Inc established a Contract APP (Application ID 001) on 91.06.03.17.00.00 (that is, 5 PM on Jun. 3, 1991) to deal with economic risk management. The application involves a pricing and matching objective function of: "minimize pre-tax consideration payment under an expected value (EV)/certainty equivalent (CE) value". Note that a negative consideration payment is allowed.

Looking at the second step in the timeline, Product Specification, in conjunction with FIG. 74, we see that BLC Inc was also product sponsor of Product 10061 at the same time (91.06.03.17.00.00). This product relates again to the market of stock indices. The maturity date for Product 10061 is 96.06.03.17.00.00.00. The sub-market is the PTSE 75 stock index. The consideration for a specific contract involving Product 10061 is in the form of money (commercial bank deposits denominated in Australian dollars). The entitlement is also in the form of commercial bank deposits denominated in Australian dollars, payable immediately after the product's specified maturity date/time.

Looking at the third step in the timeline, Potential Counterparty Product Pricing Specifications, one can find two entities, Abrahamsons and Carpenters Inc, acting as potential counterparties for forthcoming primary product orders dealing with Product 10061. At this point in the timeline (95.01.01.17.00.00.00), 43 months after the specification of Product 10061, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline, Primary Order Specification, in conjunction with FIG. 75, it can be seen that Abbotts & Taylor is seeking a contract in Product 10061 at that time (95.01.01.17.37.06.00). FIG. 75 shows the specific parameters that Abbotts & Taylor has defined for the contract it is seeking at this time, namely $A 83,830 for any feasible product value including a minimum acceptable contract consideration amount of ($A 55,000). The parentheses indicate that the consideration is negative. The calculated counter consideration ($A 55,000) will be paid by the counterparty to Abbotts & Taylor immediately after contract matching.

Looking at the fifth step in the timeline, Order Specification Pricing, in conjunction with FIGS. 76A and 76B, it can be seen that Abrahamsons (using the specified pricing parameters set at 95.01.01.17.37.06.00) prices the Abbotts & Taylor order at 95.01.01.17.38.02.00. Abrahamsons' pricing parameters, indicated by their defined circumstances ID of 31, require a commission rate of 1.25% and a discount rate of 10.00% pa. A particular set of component product prices together with a particular set of assessed probabilities of occurrence are specified. This results in a counter consideration of($A 58,710), which Abrahamsons' parameters calculate will yield them a base margin on the contract of $A 1,980.

Still looking at the fifth step in the timeline, in conjunction with FIGS. 77A and 77B, it can be seen that Carpenters Inc (again using the specified pricing parameters set at 95.01.01.17.37.06.00) also prices the Abbotts & Taylor order at 95.01.01.17.38.02.00.

Carpenters Inc's pricing parameters, indicated by their defined circumstances ID of 19, require a commission rate of 1.30% and a discount rate of 9.8% pa. A particular set of component product prices and a particular set of assessed probabilities of occurrence are specified. This results in a contract bid price of ($A 58,640), which Carpenters Inc's parameters calculate will yield them a base margin on the contract of $1,990.

Looking at the sixth step in the timeline, Primary Order Matching, it can be found that Abrahamsons' price bid of ($A 58,710) is above Carpenters Inc's bid of ($A 58,640) and above Abbotts & Taylor's specified minimum consideration price of ($A 55,000). This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons at 95.01.01.17.38.07.00. Before the matching formally occurs, a check is made that absolute loss, expected loss, expected value and portfolio attribute limits are not violated.

The seventh step in the timeline, Contact Maturity, refers to the actual determination of the product value at time of maturity, 96.06.03.17.00.00.00.

The eighth step in the timeline involves the formal payment of $A 83,830 by Abbotts & Taylor to Abrahamsons.

The example just described can also be thought of as a case where the market is irrelevant, and therefore there is no minimum or maximum product definition value nor product step value. This equates to there being no future outcome, rather simply a known specified entitlement that is not dependent upon the outcome of any particular phenomenon. The mathematical representation of curves or lines no longer is relevant. The counterparty counter consideration thus becomes a function only of the discount rate, commission and (if applicable) entitlement exchange rate.

Life Cycle of Economic Management Contract

Example V

This embodiment relates to an economic management contract (based on a variation of Example IV) and describes the formulation of an immediate exchange contract involving an entitlement of a defined $US amount in return for a to-be-determined consideration denominated in commercial bank Australian dollars.

This example is a special case of the general case of Example II in that it is independent of the outcome of any particular phenomenon. It has only a single outcome for which a single entitlement is specified by the ordering party.

Unlike Example IV, however, this case also involves a unique notion of a contract maturity date/time. This is the notion of "as soon as possible after the date/time the transaction is originated by the ordering party", implying an immediate exchange. That is, the date of maturity is now.

In this example, the offering is one which provides a contract ordering party with a specified non-contingent entitlement to receive its desired $US currency amount ($US 70,000) as soon as possible after the ordering party specifies it is prepared to immediately pay not more than $A 102,900 (as a consideration) in exchange for this US currency.

In this example, the relevant key stakeholders are: an application promoter (BLC Inc); various product sponsors (the relevant one for the example being BLC

Inc itself), various product ordering parties (the relevant ones for the example being Abbotts & Taylor), various potential counterparties (the relevant ones for the example being Abrahamsons and Carpenters Inc), a counterparty guarantor (CNZ Banking Corporation) and an application regulator (the Pacific Central Bank).

The timeline depicting the steps in the contract from the first step, Application Specification, to the final step, Contract Settlement, is shown in FIG. 42, and are supported by FIGS. 78-82B.

Looking at the first step in the timeline, Application Specification, in conjunction with FIG. 78, we see that BLC Inc established a contract APP (Application ID 201) on 91.06.03.17.00.00 (that is, 5 pm on Jun. 3, 1991) to deal with economic risk management. The application involves a pricing and matching objective function of: "maximize pre-tax consideration/ entitlement exchange rate". Application ID 201 supports a range of products.

Looking at the second step in the timeline, Product Specification, in conjunction with FIG. 79, we see that BLC Inc was also product sponsor of Product 11099 at the same time (91.06.03.17.00.00). This product relates to the market of immediate exchange. The maturity date for Product 11099 is "as soon as possible after transaction initiation'. The consideration for a specific contract involving Product 11099 is commercial bank deposits denominated in Australian dollars. The entitlement is in the form of commercial bank deposits denominated in US dollars, payable immediately after the product's specified maturity date/time (that is, as soon as possible after transaction initiation).

Looking at the third step in the timeline, Potential Counterparty Product Pricing Specifications, two entities, Abrahamsons and Carpenters Inc, are potential counterparties for forthcoming primary product orders dealing with Product 11099. At this point in the timeline (92.06.03.15.00.00.00), 12 months after the specification of Product 11099, both Abrahamsons and Carpenters Inc have currently-specified parameters for pricing potentially forthcoming orders for the product.

Looking at the fourth step in the timeline, Primary Order Specification, in conjunction with FIG. 80, it can be seen that an ordering party, Abbotts & Taylor, is seeking a contract from an offering party in Product 11099 at that time (92.06.03.17.00.00.00). FIG. 80 shows the specific parameters that Abbotts & Taylor has defined for the contract it is seeking at this time, including a maximum exchange (consideration) amount of ($A 102,900) and a defined $US 70,000 entitlement.

Looking at the fifth step in the timeline, Order Specification Pricing, in conjunction with FIGS. 81A and 81B, it can be seen that the system determines that the counter consideration amount Abrahamsons judge to be ideal given their specified parameters is $A 94,500. This occurs at 92.06.03.17.38.02.00. Abrahamsons' pricing parameters specify an exchange rate of 0.75, a commission rate of 1.25% and a single assessed probability of occurrence of one (1) (discount rate and component product prices being irrelevant in this example). The counter consideration of $A 94,500 is lower than Abbotts & Taylor's specified maximum consideration amount of $A 102,900.

Still looking at the fifth step in the timeline, in conjunction with FIGS. 82A and 82B, the system determines that the counter consideration amount Carpenters Inc judge to be ideal given their specified parameters is $A 101,300. Carpenters Inc's pricing parameters imply an exchange rate of 0.70, a commission rate of 1.30% and a single assessed probability of occurrence of one (1) (discount rate and component product prices again being irrelevant).

Looking at the sixth step in the timeline, Order Matching, it can be found that the system assesses Abrahamsons' to be superior to that of Carpenter Inc and below Abbotts & Taylor's maximum consideration. This leads to a formal matching of Abbotts & Taylor's order by Abrahamsons' at 92.06.03.17.38.12.00. Matching coincides in time with maturity, and very shortly thereafter there is the transfer of $A 94,500 from Abrahamsons to Abbotts & Taylor and a corresponding transfer of $US 70,000 from Abrahamsons to Abbotts & Taylor. This then represent finalisation of the transaction, including all the transfers involved at the date/time of maturity of other contract types.

A further embodiment, relevant to each of the embodiments of Examples III to V above, involves the order pricing procedure as before, followed by a step of obligating the ordering party with the would-be matched counterparty for a period of time before the match is formally made. As before, the consideration can be payable immediately upon match or deferred for a time (even up until maturity), and the date of maturity can be at a future time from matching (or even immediately upon match). The period of obligation can be specified by the promoter stakeholder, and thus be known to the ordering party and the registering counterparties. The period of obligation thus enables parties to contract to future contingent contracts (in the case of Examples I and IV) or future exchange (in the case of Example V).

7. Description of Consideration/Entitlement Payment Process

The purpose of the CONTRACT APP consideration/entitlement (and related transactions) payment/receipt process is to effect debits and credits to INVENTCO stakeholder accounts, typically at maturity of a contract, with participating consideration/entitlement transfer (or exchange) entities, reflecting payment/receipt entitlements and obligations originated within INVENTCO. The process effects these payments/receipts in a two-stage process. First, by debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts with a participating consideration/entitlement transfer entity (C/E entity), external to INVENTCO, with which they maintain an account. And second, by periodically effecting, via existing and potential payment mechanisms, corresponding payment instructions to the payment entities concerned. Details of the above-described mechanism are as follows.

All INVENTCO stakeholders maintain (a minimum of) two special-purpose (net-credit balance only) accounts with (at least) one selected, VIRPRO authorised, C/E transfer entity. The purpose of special-purpose accounts is to ensure that only INVENTCO-initiated debits and credits are capable of being effected to the accounts. Thus, at any time the balance of each PAYACC SHADOW file account record should be equivalent to the true, but usually unknown, time-of-day balance of the actual account maintained by the C/E transfer entity.

The purpose of two accounts is to enable only credits to be effected through one account and only debits through another account. And the purpose of "net-credit balance only" accounts is to ensure that accumulated debits to the debits-only account never exceed the account opening balance plus accumulated credits to the credits-only account.

C/E transfer entities will typically be (but do not need to be) institutions of any/all of six types: public/private record-registries of various types; credit card companies (typically for retail transactions only); commercial banks; central banks; taxation authorities; and non-bank clearing houses and depositories.

The resources transferred by these entities may be of any type. However most typically, they will be deposits appropriate for the entity concerned: With respect to public/private record-registries—entitlement deposits (including shares in financial or physical assets, participation rights in wagers, and so on). With respect to credit/debit card companies—normal card company deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to commercial banks—normal bank deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to central banks— exchange settlement account (or equivalent) deposits. With respect to taxation authorities—taxation account deposits. And with respect to non-bank clearing houses and depositories—deposits of financial instruments, precious metals and the like. CONTRACT APP potential counterparties will also effectively be C/E transfer entities, as will ordering party guarantors (external to INVENTCO) where they offer credit to product ordering parties. Also, some accounts will be trust accounts maintained on behalf of potential counterparties (and some product ordering parties) involved in applications requiring the periodic payment of collateral to independent third parties to serve as an additional security device.

Immediately after the completion of its daily—or more frequent—transaction processing, and their associated settlement functions, each C/E transfer entity electronically notifies the applicable CONTRACT APP of the "opening balances" of all the debit and credit INVENTCO accounts it maintains (At this stage, the debit account balance should be zero and the credit account balance should be greater than or equal to zero). Where an INVENTCO stakeholder has an overdraft or line-of-credit with its C/E transfer entity, the credit value of this will be reflected in the non-zero balance of its credit account at this time.

Upon receipt of the above-described notifications, the applicable CONTRACT APP updates/confirms its stakeholder shadow balances. Thus, at this point-in-time, all credit and debit shadow account balances should be equivalent to their actual debit and credit account balances.

Progressively throughout the day (where "day" here is likely to be different for each C/E transfer entity due to a combination of differences in the time-zone locations of payment entities in relation to the applicable CONTRACT APP, and the likely different account processing cycles of these entities), INVENTCO-stakeholder—authorised 15 debits and credits to INVENTCO stakeholder shadow accounts are effected on a real-time basis— debits to debit accounts and credits to credit accounts. At all times, the CONTRACT APP ensures that the cumulative debit balance of each stakeholder's debits account does not exceed the "opening balance" plus the cumulative credit balance of the stakeholder's credit account. Thus, at any time, for every INVENTCO stakeholder, the combination of each stakeholder's debit account and credit account will represent the "true", net, time-of-day value of the stakeholder's two actual special-purpose accounts maintained external to INVENTCO.

Debits and credits to INVENTCO stakeholder accounts are effected according to strict rules and conditions, being different for credits and debits. Credits can be made to any INVENTCO stakeholder's credit account with its nominated C/E transfer entity by any other INVENTCO stakeholder for any reason. Naturally, as INVENTCO stakeholders will not know the account details of other stakeholders, such credits will be effected either automatically, according to information and rules known by the applicable CONTRACT APP, or semi-automatically by way of an INVENTCO stakeholder requesting from VIRPRO, as they need to do so, a credit-account number of the stakeholder to which they wish to transfer assets. This account number may only be valid for a nominated period and would not typically be the specified stakeholder's actual account number with its nominated consideration/entitlement transfer entity—it would only be a reference to an INVENTCO file containing this number.

On the other hand, debits can only be made to an INVENTCO stakeholder's debit account with its nominated C/E transfer entity by the stakeholder itself, and by other stakeholders explicitly granted this right by each stakeholder, subject to these other stakeholders exercising this right according to the rules and conditions specified for them.

Where an INVENTCO stakeholder seeks to initiate/authorise debits to its nominated account(s) on its own, this can only be done through the stakeholder satisfactorily completing the identification and security procedures set down by their C/E consideration/entitlement transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). The type of procedure set down by all participating C/E transfer entities involves (at least) the following: First, the consideration/entitlement transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts, and a similarly confidential "black box" which, by initiating any of a number of possible proprietary password request-response processes involving any one of its customers possessing the appropriate device(s), confirms that remote messages received from that customer, and processed by the "black box", are authentic. Second, the consideration/entitlement transfer entity supplying their INVENTCO customers with a programmable smart card (or equivalent device) enabling each customer, remotely—via telephone or direct computer line, to unambiguously confirm their identity with their INVENTCO-maintained account, thereby having the capability to authorise debits to their account within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on. Third, INVENTCO providing the mechanisms for direct, confidential, stakeholder communications with their C/E transfer entity shadow debit accounts, and the formal updating of these accounts, through non real-time processes, utilizing the unique time-stamped reference numbers created as/when stakeholders authorise access to their account records.

Where an INVENTCO stakeholder has authorised other INVENTCO stakeholders to initiate debits to (any of) its nominated account(s) according to a standing authority of some type, this can only be done through the authorised stakeholder itself satisfactorily completing the identification and security procedures set down by the authorisation-granting stakeholder's nominated C/E transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). Once again, the type of procedure, set down by all participating C/E transfer entities in this respect, involves (at least) the following: First, the C/E transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts and each other INVENTCO stakeholder which has been authorised to effect debits (within defined parameters) to these accounts. Second, the C/E transfer entity supplying VIRPRO with a similarly confidential black box which, by initiating any of a number of possible proprietary password request-response processes involving an entity nominated by any of its customers possessing the appropriate device(s), confirms that remote messages received from that authorised entity, and processed by the black box, are authentic. Third, the C/E transfer entity supplying their INVENTCO customers with a collection of programmable smart cards (or equivalent devices), for distribution to these authorised entities, enabling each authorised entity, remotely— via telephone or direct computer line—to unambiguously confirm their identity with the customer's PAYACC SHADOW account, thereby having the capability to authorise debits to this account (again, within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on). And four, INVENTCO providing the mechanisms for direct, confidential, authorised stakeholder communications with a stakeholder's C/E transfer entity shadow debit account(s).

At the end of each C/E transfer entity's specified day (or part of a day), the applicable CONTRACT APP transfers (at least) two things to the entity: First, if required, a series of figures representing the exchange settlement (or equivalent) accounting entries it has or will communicate to the C/E transfer entity's appropriate clearing authority (for each of the applicable consideration/entitlement denomination, currency and national currency types of the payments/ receipts involved) where these figures represent the balancing net debit or credit figure corresponding to the aggregation of all of the entity's INVENTCO customer transactions in the prior day. And second, a detailed file of all customer transactions effected during the day (corresponding, if required, to the above-described net figures). Upon their receipt of these transactions and summary figures, the C/E transfer entity then debits/credits each transaction to the appropriate actual customer accounts, enabling new "closing" account balances to be calculated (these "closing" balances should be exactly the same as the end-of-day balances communicated by the applicable CONTRACT APPS with it's file of customer transactions). In turn, these "closing balances" become the C/E transfer entity's account "opening balances" for the next day. The CONTRACT APPS notification process then repeats itself.

Where applicable, at days-end for the "clearing house" of clusters of like C/E transfer entities (for example, a national central bank), CONTRACT APP transfers netted exchange settlement accounting entries to the clearing houses concerned. These entries serve to "balance the individual customer account entries transferred to each associated C/E transfer entity individually.

8. Industrial Applicability

The invention has industrial application in the use of electrical computing devices and data communications. The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices. The types of events associated with the risk management apparatus and methodologies includes physical and technical phenomena, and therefore have value in the field of economic endeavour.

GLOSSARY OF KEY TERMS

Alpha (X)

> The Ordering party-specified event value corresponding to the xth future product event value contract entitlement payoff (payout) inflection point.

Application Promoter

> An entity authorised by VIRPRO that specifies and administers defined rules and regulations underlying a defined CONTRACT APP—including the specific products offered for trading; categories of, and conditions of involvement, of stakeholders; nature of

involvement and dispute resolution procedures of stakeholders.

Automatic/Manual Deal and No Deal Flags

Indicators notified by each stakeholder to CONTRACT APP specifying the manner in which that stakeholder wishes to deal with each other stakeholder.

AXSCO

A communications co-ordination and security system, linked to all stakeholders and component applications.

Base Pricing Probabilities

The prices set by sellers for unit entitlement payoffs of a contract at each of its possible future index values denominated in the contract's formally specified consideration/entitlement, currency and national currency.

Beta (X)

The Ordering party-specified desired entitlement payoff (payout) amount in the desired currency denomination of contract entitlement payout (payoff) and national currency denomination of contract entitlement payout (payoff) corresponding to the Xth event value inflection point.

Bilateral Obligations Netting Indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all pairs of participating stakeholders are to be netted.

Bilateral Payments Netting Indicator

An indicator that individual end-of-day gross payments/receipts to/from all pairs of participating INVENTCO stakeholders are to be netted.

Commission Rate

The minimum required percentage profit margin required by a Potential Counterparty above the "breakeven" bid price for an Ordering party purchase order.

Consideration/Entitlement Transfer Entity

An entity acceptable to VIRPRO and the Application Promoter, satisfying defined minimum standards of financial strength, credit standing and integrity, able to maintain Consideration/entitlement accounts on behalf of stakeholders and effect transfers of those assets as directed.

CONTRACT APP Stakeholder Types

Expected stakeholder types are Application Promoter, Product Sponsor, Product Ordering party, Counterparty, Counterparty-Guarantor, Regulator, Consideration/entitlement Transfer Entities and Miscellaneous other parties.

Contract and Product "Absolute Loss" Limit

A value limit specified by a potential counterparty of the maximum absolute loss it is prepared to sustain on a contract/product irrespective of the assessment of the likelihood of any particular level of possible loss being incurred.

Contract and Product "Expected Loss" Limit

A value limit specified by a potential counterparty of the maximum expected loss it is prepared to sustain on a contract/product based on the counterparty's assessment of the likelihood of all levels of possible loss being incurred.

Contract Authorisation

A process of verifying that an Ordering Party product purchase order contains data appropriate to the product being sought and that the Ordering Party is accurately identified and credential led.

Contract Collateralisation Indicator

A descriptor set by the Application Promoter specifying whether and on what basis, counterparties may be required to periodically transfer assets/ monies (collateral) to an independent trust fund to ensure they will be able to meet their potential entitlement payoff obligations on the maturity date of a contract.

Contract Confirmation

The process of securing the positive agreement of all affected stakeholders to a purchase order, including acknowledgement by the relevant Consideration/ entitlement transfer entity of the Ordering party's ability to pay the required product consideration and fees, either automatically or through manual approvals.

Contract Matching

See Ordering party/Potential counterparty matching process.

Contractual Obligation

a. A binding commitment one entity (or group of entities) has to provide products or services or information to another entity (or group of entities) in exchange for an agreed quantity of other products, services or information.

b. A binding commitment all entities have to the network and general management system entity VIRPRO and thus to each other, to accept constraints on their activities imposed by other authorised entities on terms specified and agreed to by them as a condition of their participation in one or more of the component systems.

Contract Portfolio Netting

A term used to describe the process of "setting-off" or "netting", the future payment entitlement obligations between Ordering parties and Counterparties, either bi-laterally or multi-laterally.

Currency and National Currency Exchange Rates

The rates used to convert contract consideration/ entitlement currency and national currency requirements into the product's consideration/entitlement currency and national currency denomination.

Deal Flag

An indicator or "flag" notified to CONTRACT APP signifying that the stakeholder is satisfied to deal unreservedly with the stakeholder against whom the flag has been set.

Defined Circumstances

The possible combinations of the categories of product-order information provided by Ordering parties.

Defined Probability Distributions

A set of pricing probability parameters specified by an Ordering party and including at least, a probability distribution type identifier, the expected value of the distribution, the standard deviation of the distribution and a probability distribution adjustment value or function.

Desired Currency Denomination of Contract Entitlement

A term indicating the currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired Currency Denomination of Consideration Payment

A term indicating the currency in which an Ordering party wishes to pay the required consideration for the contract sought.

Desired National Currency Denomination of Contract Entitlement

A term indicating the National currency in which an Ordering party wishes to receive potential entitlement payments from the sought contract.

Desired National Currency Denomination of Consideration Payment

A term indicating the National currency in which the Ordering party wishes to pay the required consideration for the contract being sought.

Discount Rate

The rate used to determine the present value of a potential counterparty's expected future entitlements.

Entitlement

The payout expected by the offering party at maturity as specified for each outcome in the range of outcomes. The payout can be both positive and negative in value over the range of outcomes, and can be in the form of money or other non-money types of goods, services, promises, credits or warrants.

EV-CE Pricing

A price discovery mechanism for primary contracts meaning "expected value certainty equivalent pricing" being the calculated expected present value or future value of the contract.

Expected Value

A function in EV-CE pricing which means the sum of the products of all possible contract entitlement payoff/payout amounts and the Ordering party's/Counterparty's assessment of the probability of occurrence of the future events which would contractually give rise to these entitlement payoff amounts.

Expected Value Limits on a Counterparty's Aggregate Product Portfolio

Optional value limits specified by a Potential counterparty at any one time, where time can be specified in terms including "equivalent maturity date"; "same-month maturity date" and "all possible maturity dates" including product expected loss limits and maximum (and possibly minimum) proportion of the expected total loss of the aggregate of the Counterparty's product portfolio that can be accounted for by the expected loss on the individual contract/product.

Gamma(X)

The Ordering party-specified desired shape of the function between each of the coordinates Alpha(1), Beta(1) and Alpha(2), Beta(2) and so on; such that Gamma can represent all possible mathematically definable shapes.

I-INVENTCO

The infrastructure component of INVENTCO.

INVENTCO

A collection of one or more (potentially interrelated) systems, where each system is the combination of a telecommunications, computing and other forms of infrastructure, and a variety of markets and support services distributed by this infrastructure.

M-INVENTCO

A depository of VIRPRO authorised "markets" application software.

Manual Deal Flag

An indicator or "flag" notified to CONTRACT APP by a stakeholder signifying that the stakeholder wishes to manually approve a transaction involving the other stakeholder against whom the flag has been set.

Multilateral Payments Netting Indicator

An indicator that individual end-of-day gross payments/receipts to/from all participating stakeholders from/to a specified third party trustee/clearing entity are to be netted.

Multilateral Obligations Netting Indicator

An indicator that individual 'rolling' net present values of future payment/receipt commitments to/from all participating stakeholders from/to a third party trustee/clearing entity are to be netted.

Negative Contract Payoffs

A type of contract in which the contract Ordering party may have a contingent payoff to the contract's Potential counterparty (i.e. the reverse of a normal contract).

No Deal Flag

An indicator or "flag" notified to a CONTRACT APP by a stakeholder signifying that the stakeholder does not wish to deal in any way with the other stakeholder against whom the flag has been set.

Ordering Party Contingent Claims Function

Specifications of a product payoff or a mathematical function to calculate an Ordering party's product payoff requirement.

Portfolio Product "Expected Loss" Limit

A value limit, specified by a potential Counterparty, of the maximum expected loss the potential Counterparty is prepared to sustain on its product portfolio based on the Counterparty's assessment of the likelihood of all levels of possible loss being incurred.

Product Ordering Party

An entity acceptable to VIRPRO and the Application Promoter, interested in and able to acquire a CONTRACT APP product.

Product Establishment Date/Time

The date/time an Application Promoter first offers a defined product for trading.

Product Future Event Value "Density" Indicator

An indicator specifying the number of intermediate points between the minimum and maximum future event product definition values specified for the product by the Application Promoter/Product Sponsor.

Product Event Value "Width" Indicator

An indicator specifying the range (minimum-maximum) of future event values accommodated by the product as set by the Application Promoter/Product Sponsor.

Product Future Event Value

A term used to indicate the actual value of a defined product at its date/time of maturity.

Product Maturity Date/Time

The date-time at which the Application Promoter is required to make a determination of the actual event value to enable entitlement and related payoffs on successful contracts.

Product Price Quote Requests

A type of product purchase order for which the matching process is terminated and the result communicated to the Ordering party, when a desired price bid or range of price bids has been obtained.

Product Purchase Orders

Specific product purchase orders for which the Ordering party is seeking a potential Counterparty match, which may be of three types: automatic orders; manual orders and "hide" orders.

Product Purchase Order Withdrawals

Ordering party-initiated requests to withdraw from processing pre-submitted but as yet unconfirmed product purchase orders.

Product Potential Counterparty

An entity acceptable to VIRPRO and the Application Promoter, exceeding a defined minimum standard of financial strength, credit standing and integrity, offering defined

CONTRACT APP products to product Ordering parties.

Product Sponsor

An entity acceptable to VIRPRO and the Application Promoter, having responsibility for detailed definition of product parameters including the continual determination of product values over time.

Regulator

An entity acceptable to VIRPRO having local, state, national or international jurisdiction over one or more CONTRACT APPS.

Set of Pricing Probabilities

The range of probabilities a potential Counterparty applies to a class of Ordering party order, specified by the value of "defined circumstances" and applying to every feasible future product event defined for that product by an Application Promoter.

Stakeholder

An entity that is a registered participant in one or more of INVENTCO's component parts.

Value Dates

The respective dates/times at which matched contract consideration and entitlements are agreed to be made by the relevant Ordering party/Counterparty to a contract.

VIRPRO

The network and general management system component of INVENTCO.

"X"

A term indicating the number of contract payoff (payout) inflection points the Ordering party is seeking within the allowable range of future product event values (including the value range extremity points).

CONTRACT APPS

Overview

CONTRACT APPS is a term used to refer to certain types of units of applications software which can, but do not need to, reside within an INVENTCO system's (M-INVENTCO) depository of "markets" software. The purpose of individual CONTRACT APPS is two-fold: First, to effect the trading/exchange/transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others within INVENTCO registered as having a legitimate interest in the nature, size and composition of these trades/exchanges/transfers. And second, to appropriately manage all matched/confirmed contracts through to their time of maturity, including their ultimate settlement.

Individual CONTRACT APPS perform theses tasks according to the specific rules they embody, defined by their own stakeholders. CONTRACT APPS effectively reside upon AXSCO and within M-INVENTCO.

Stakeholder Types

CONTRACT APPS accommodate eight (and potentially fewer) generic types of their "own" stakeholders (as distinct from other INVENTCO stakeholders) termed: application promoter, product sponsors, product ordering parties, potential product counterparties, counterparty-guarantors, regulators, consideration/entitlement transfer entities, and other miscellaneous parties.

Some details of these stakeholders are as follows: an application promoter is an entity having overall responsibility for the functioning of a CONTRACT APP (that responsibility having been granted by VIRPRO); a product sponsor is an entity which promotes and administers the rules of trading, and subsequent management, of defined contingent claims contracting product(s) selected for inclusion in a CONTRACT APP by its application promoter; a product ordering party is an entity seeking to acquire a CONTRACT APP product from a potential product counterparty (where a product ordering party can also be a product counterparty); a potential product counterparty is an entity potentially prepared to satisfy the CONTRACT APP product needs of a product ordering party (where a potential product counterparty can also be a product ordering party); a counterparty-guarantor is an entity guaranteeing a product counterparty's ability to settle any/all of its potential entitlement transfer obligations to a product ordering party to which it has become a counterparty as a result of a CONTRACT APP effected " match"; regulators are entities overseeing the on-going performance of all other stakeholders involved in a CONTRACT APP, especially counter-party-guarantors; consideration/entitlement transfer entities are entities with which all other CONTRACT APP stakeholders maintain "accounts" to transfer required considerations/entitlements to/from all each other; and miscellaneous parties are all other entities having a defined stake in the functioning of a CONTRACT APP.

Miscellaneous parties include: independent entities contracted by application promoters or product sponsors to formally determine the "value" of products on their date-of-maturity; multilateral obligations and payment netting trustee/clearing entity organisations; independent (non-regulator) taxation and other governmental authorities; electronic "gateway" providers (external to INVENTCO); and host system organizations (in the case of CONTRACT APPS within INVENTCO systems linked to a common host system). CONTRACT APPS accommodate any number of their own stakeholders of each of the above-defined generic types.

Product Types

CONTRACT APPS can support risk aversion contract "product types" with any combination of values of multiple attributes, including: the fundamental nature/purpose of the product; the establishment/maturity date/time of the product; the consideration/entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/entitlement identifiers associated with the product; the "width" and "density" identifiers of possible future event values of the product; and miscellaneous other product descriptors.

The "fundamental nature/purpose of the product" attribute may incorporate identifiers including: a conditional entitlement-payoff dimensions identifier; a market identifier; a sub-market identifier; and a market-type identifier. The "conditional entitlement-payoff dimensions identifier" specifies the number of dimensions to an ordering party's sought-after conditional entitlement-payoffs. The market identifier specifies whether the product relates to an "actual" or "perceived" phenomenon (or phenomena), the number of such phenomena (if applicable), and the applicable phenomenon category (for example, industrial, scientific, financial market hedging, and so on). The sub-market identifier provides a more specific description of the product concerned. The market-type identifier specifies the applicable future period date/time (where this can be anything—for example, "at a defined contract maturity date/time", "at a specified time on or before contract maturity date/time", and so on), and type-of-future event involved (where, again, this can be anything—for example, as an indicator of some relative value of a phenomenon (spot value, average value and so on), or as an indicator of the "rate-of-change" of some value of a phenomenon.

The "establishment and maturity date/time of the product" attribute specifies, respectively, the date/time an application promoter first offered a product for trading, and the date/time at which the defined product matures (that is, the date/time at which the product sponsor is required to make a determination of the actual event value at that date/time so enabling contract entitlement transfers to be effected).

The "consideration/entitlement denomination type, currency (if applicable), and national currency (if applicable) consideration/entitlement identifiers associated with the product" attribute specify: the type of consideration/entitlement involved (where this can include rights and entitlements, physical assets, and "money" of all possible types); in the case of a "money" consideration/entitlement type, the currency of the consideration/entitlement (where such currency types can include: public/private record-depository deposits, commercial credit card company deposits, commercial bank deposits, central bank deposits, taxation authority deposits, and deposits in non-bank clearing houses and depositories, and the like); and, again, in the case of a "money" consideration/entitlement type, the national currency of the consideration/entitlement identifier (where such national currency types can be in any national currency, or form of synthetic currency).

The "width and density identifiers of possible future event values of the product" attribute specifies, respectively: the minimum and maximum values of the allowable range of future event values accommodated by a product; and the number of intermediate points between the defined minimum and maximum future event values accommodated by the product.

The "miscellaneous other product descriptors" attribute specifies such things as: the degree of stakeholder access granted the product by the application promoter in question; the forms of trading-services granted the product by the application promoter in question (where this product attribute specifies the accessibility of the product to a range of feasible "stakeholder services" with respect to such things as contract portfolio netting, contract collateralisation, consideration credit provision, ordering party ability to specify negative contract entitlements, and availability of secondary/derivative market product trading); and the degrees of trading, clearing and settlement "transparency" granted the product by the application promoter in question.

Transaction Types

A range of primary, secondary, derivative-primary, and derivative-secondary risk aversion contract transactions are accommodated by CONTRACT APPS.

The range of "primary" (and derivative-primary (options, for example)) risk aversion Contract transaction-types (handled principally by Processes 2 and 4 include: ordering party product orders (and option orders) for which the ordering party is seeking a counterparty "match", ordering-part), price quote (and options price quote) requests; and ordering-party withdrawals of existing product orders (and withdrawal of options on product orders). Ordering party product orders consist of: automatic orders and manual orders. Automatic orders consist of: normal automatic orders (being orders the ordering party is prepared to have matched automatically, subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the ordering party is prepared to have matched automatically, subject to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the ordering party). Manual orders consist of normal-manual orders (being orders the ordering party wishes to manually authorise before they are finalised—that is, after a counterparty "match" has been effected but before the contract has been "confirmed"—subject only to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have respecified); and anonymous-manual orders (being orders the ordering party wishes to manually authorise before they are finalised— that is, after a counterparty "match" has been effected but before the contract has been "confirmed" subject to the constraints defined in the ordering party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have respecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the ordering party).

The range of "secondary" (and derivative-secondary (options, for example) risk aversion contract transaction-types (handled principally by Processes 3 and 5 include: acquiring party product orders (and option orders) for which the acquiring party is seeking to "acquire" the position of a specified "risk counterparty" stakeholder in an existing contract; acquiring-party product price indications (and option price indications); and acquiring-party withdrawals of existing product orders (and option withdrawals).

Acquiring party product orders for which the acquiring party is seeking to "acquire" the position of a specified "risk counterparty" stakeholder in an existing contract, consist of automatic orders and manual orders.

Automatic orders consist of: normal-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject only to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-automatic orders (being orders the acquiring party is prepared to have matched automatically, subject to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has sought to manually authorise the transaction and, through so doing, being able to potentially identify the acquiring party).

Manual orders consist of normal-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised—that is, after a "match" has been effected but before the contract "sale" is " confirmed"—subject only to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified); and anonymous-manual orders (being orders the acquiring party wishes to manually authorise before they are finalised—that is, after a "match" has been effected but before the contract "sale" is "confirmed"—subject to the constraints defined in the acquiring party's order, in addition to whatever "match" constraints other CONTRACT APP stakeholders have prespecified, provided that no CONTRACT APP stakeholder has also sought to manually authorise the transaction and, through so doing, potentially identify the acquiring party).

Primary Product Pricing Process Types

CONTRACT APPS enable potential counterparties to automatically establish "bids" on any defined (primary and derivative-primary) product order according to either an "expected value/utility-certainty equivalent" (EV/U-CE) pricing regime, or any other mathematically-definable pricing regime.

In the case of an "expected value-certainty equivalent" (EV-CE) pricing regime, each potential counterparty specifies, amongst other things: an indicator of certain defined attributes of an as-yet-unknown product order; a base commission rate; a base discount rate; (if applicable) a set of base consideration/entitlement denomination, currency, and national currency exchange rates; base unit product prices; and desired adjustments to the preceding base-bid-price determinants dependent on any specific order (submitted by a specified ordering party).

The above-described indicator of certain defined attributes of an as-yet-unknown product order (termed, defined circumstances) may reflect any combination of the multiple characteristics of an order (irrespective of the ordering party concerned), including: the multiple attributes of the contingent claims function sought; the ordering party's interest or otherwise in being granted credit by a counterparty; the ordering party's interest or otherwise in participating in the possible netting and collateralisation features of the APP; and the maximum (and possibly minimum) consideration amount the ordering party is prepared to pay for their defined product. The above-described base commission rate specifies the minimum required percentage profit margin required by the counterparty above their breakeven consideration bid price for a product order.

The above-described base discount rate determines the present value of the counterparty's expected future entitlement associated with a contract (net of the ordering party's consideration, and making allowance for the future income stream this consideration is expected to generate). The above-described set of base consideration/entitlement denomination, currency and national currency exchange rates are used, where applicable, to convert an ordering party's contract requirements into the base consideration/entitlement denomination, currency and national currency of the product so enabling the contract matching process to make like comparisons of counterparty bids for product orders.

The above-described base unit product prices are prices set by potential counterparties for unit entitlement-payoffs of a contract at each of its possible future values, denominated in the contract's formally specified consideration/entitlement type and, if applicable, currency type and national currency type (where these unit prices can be specified as directly input figures for every feasible future product event (the sum of which may or may not add to 1), or as parameters of defined mathematical functions). The above-described desired adjustments to the preceding base-bid-price determinants dependent on the specific ordering party submitting a specific order can include: a commission rate adjustment; a discount rate adjustment; a consideration/denomination exchange rate adjustment; a currency exchange rate adjustment; and a national currency exchange rate adjustment.

In the case of an "expected utility-certainty equivalent" (EU-CE) pricing regime, each potential counterparty specifies all of the above-described parameters applicable to a EV-CE pricing regime as well as "utility bench-mark" figures for all possible consideration and entitlement "payment amounts" which could, conceivably, be associated with a product/contract.

Primary Product Matching Process Types

CONTRACT APPS may similarly accommodate any of a number of possible (primary and derivative-primary) order matching processes where these processes can be of multiple types, including sequential processes and simultaneous processes.

Sequential order matching processes can be characterised according to the "sequence determining" and "matching" rules they embody, where "sequence" rules may be of various types: "last-in-first-out (LIFO)", "first-in-first-out" (FIFO)", priced priority, and so on; and matching rules may also be of various types—for example, a specific matching process could seek, for each product ordering party, a counterparty (or counterparties) offering a product price at or below the maximum price the ordering party is prepared to pay (where the determined contract price could be either the lowest price offered by a potential counterparty, the mid-point between the an ordering party's specified "maximum consideration amount" and the lowest price offered by a potential counterparty, and so on); or seek for each potential product counterparty an ordering party prepared to pay the maximum price above a price at which the counterparty is prepared to deal (here, the determined contract price could be either: the ordering party's "maximum consideration amount" price, the mid point between the minimum price the counterparty is prepared to receive and the ordering party's "maximum consideration amount" price, and so on).

Simultaneous order matching processes are those seeking some type of optimum solution according to pre-defined objectives. For example: "maximise the number of ordering party-counterparty matches"; "maximize the aggregate consideration and/or entitlement value of ordering party-counterparty matches"; or "minimize the value of a function specifying the sum of the differences (possibly weighted according to their perceived importance) between the actual and desired values of match attributes of ordering parties and counterparties".

Both of the above-described sequential and simultaneous matching processes can also accommodate conditional contract matching rules; and pre and post tax price optimisation mechanisms.

Application Types

CONTRACT APPS may be: "in-house" APPS or "public" APPS; "single potential counterparty" APPS or "multiple potential counterparty" APPS; APPS with differing degrees and forms of "regulator" oversight of other application stakeholders; and APPS with differing degrees and forms of "counterparty-guarantor" oversight of product potential counterparties.

CONTRACT APPS support consideration "payment" value dates being "immediate" (meaning exactly the time at which a contract match is confirmed); or deferred until a defined time in the future, measured in terms of seconds, minutes, hours, or days. Similarly, CONTRACT APPS support entitlement "payment" value dates being "immediate" (meaning exactly the time at which the applicable application promoter formally notifies other CONTRACT APP stakeholders of the "result" of a maturing contract); or deferred until a defined time after the "result" of a maturing contract is known.

CONTRACT APPS allow contracts to be modified and liquidated after their creation. Contracts can be modified through: direct negotiation by the relevant "risk counterparties" to a particular contract; or the purchase/sale of "derivative" secondary risk aversion contract transactions (See Process 5 description below). Contracts can be similarly liquidated after their creation through sale of the contract (within or outside INVENTCO); and through direct negotiation between the initial ordering party and counter-parties to the contract. They can also be effectively liquidated through the ordering party/counterparty acquiring a mirror image of the contract to which they are a party (within or outside of INVENTCO).

Post Order Process Types

CONTRACT APPS undertake various generic types of "post-order-process" management functions for all the above-described generic types of "transactions", including: a function which maintains a formal record of contractual commitments entered into by all CONTRACT APP stakeholders with one another, and with VIRPRO-authorised entities external to either the applicable CONTRACT APP or INVENTCO overall; a function which effects the independent valuation of consideration and entitlement obligations between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects "collateralisation" consideration/entitlement transfers between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP, based on above-described value-tions of consideration and entitlement oblige-tions associated with CONTRACT APP transactions; a function which determines and effects, as required, the bi-lateral netting of accumulated "consideration/ entitlement" obligations" between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, the multi-lateral netting of accumulated "consideration/entitlement" obligations" between CONTRACT APP stakeholders, and between CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nominated third-party "clearing house" entity); a function which manages the processing, accounting, reporting, and entitlement "payment" tasks associated with maturing contracts; a function which determines system usage and access fees payable to/from all CONTRACT APP (and other INVENTCO) stakeholders, and to/from VIRPRO-authorised entities external to INVENTCO; a function which determines and effects, as required, "bi-laterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders themselves, and from/to CONTRACT APP stakeholders and VIRPRO-authorised entities external to each applicable CONTRACT APP; a function which determines and effects, as required, "multi-laterally netted" consideration/entitlement transfers from/to CONTRACT APP stakeholders themselves, and from/to CONTRACT APP stake-holders and VIRPRO-authorised entities external to each applicable CONTRACT APP (involving a nomin-ated third-party "clearing house" entity); and a function which compiles and distributes CONTRACT APP (and other INVENTCO) stakeholder customised information.

Supplementary Process Types

CONTRACT APPS undertake various other types of support processes, including: enabling stakeholders to transfer consideration, entitlement and other "payment" obligations to and from one another, independently of transfers initiated by CONTRACT

APP transactions (See Process 7 description below); providing CONTRACT APP (and other INVENTCO) stakeholders with shared access to specialist systems to assist them to decide how best to interface with the multiple aspects of INVENTCO (See Process 8 description below); and providing CONTRACT APP (and other INVENTCO) stakeholders with access to a range of INVENTCO-facilitated "value added services" (See Process 9 description below).

Order Matching Constraint Types

For their operation, CONTRACT APPS require all stakeholders to a specific APP to specify, amongst other things, which other stakeholders they do and do not want to have interactions with, and the conditions under which they wish to manually authorise some aspect of a transaction involving any other CONTRACT APP stakeholder over which they have control authority of some form.

In specifying which other stakeholders they do and do not want to have interactions with, CONTRACT APP stakeholders have various options. Application promoters can specify acceptable product sponsors, products, ordering parties and potential counterparties within their application—individually and by type. Similarly, product sponsors can specify acceptable application promoters, products, ordering parties, potential counterparties and counterparty-guarantors within their application—individually and by type.

Product counterparties and ordering parties (collectively) can specify: ordering parties/potential counterparties they do and do not want to deal with—individually and by type; the extent of their preparedness to be involved in contract netting and collateralisation arrangements provided for by their application promoter; application promoters, product sponsors, products, and consideration/entitlement transfer entities they do and do not want to deal with—individually and by type; ordering parties/ potential counterparties they prefer to deal with, and those with which they wish to deal exclusively; the degree of trading transparency they require; and their wish or otherwise to manually authorise order matches before they are confirmed.

Potential counterparties can specify which ordering parties, or classes of ordering parties, they are prepared to offer credit to (and under what terms), and ones they are prepared to allow "ordering party-guarantors" to offer credit to and under what terms. Similarly, product ordering parties (uniquely) can specify: counterparty-guarantors with which they do and do not want to deal (individually and by type); counterparties with which they wish to deal exclusively or preferentially to obtain a particular form of counterparty-credit; and potential "ordering party-guarantors" (external to INVENTCO) with which they do and do not want to deal.

Counterparty-guarantors can specify which potential counterparties have their authority to operate and which application promoters, product sponsors and ordering parties they are prepared, indirectly, to have relationships with. Similarly, regulators can specify which counterparty-guarantors, potential counterparties, ordering parties, application promoters, product sponsors and products have their authority to operate. Finally, consideration/ entitlement transfer entities can monitor and maintain up-to-date rules with respect to ordering parties, counterparties, application promoters, product sponsors, counterparty-guarantors, and regulators they are and are not prepared to deal with—individually and by type.

Ordering Party Requirements

For their operation, CONTRACT APPS require primary product ordering party stakeholders to a CONTRACT APP, in registering an order for a product of their choice, to specify: the above-described "product type" and "other stakeholder involvement" information; multiple attributes of the specific order they are seeking; their interest or otherwise in being granted credit by potential counterparties for their contract consideration amount, or in availing themselves of the possible netting and collateralisation features of the APP concerned; the maximum (and possibly minimum) consideration "price" they are prepared to pay for their defined product; and various other dimensions of their needs, where these include: the name/title by which they wish to be identified by other APP stakeholders; the time at which they wish their order to be submitted; the period of time after an order has been submitted that they wish the order to be retained before it is automatically withdrawn; whether or not they are prepared to accept partial matches of their order; the degree of market transparency they wish to be exposed to; whether or not they wish to have the option of trading a matched contract on an authorised INVENTCO secondary market (See Process 5 description below); whether or not they wish to manually consider/authorise potential counterparty quotes on an order; in the case where potential counterparty quotes are required to be manually considered/authorised, the maximum time after potential counterparty quote details are provided to the ordering party that the ordering party wishes to consider the quote(s); and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received.

The above-mentioned multiple attributes of a specific primary order an ordering party is seeking include: their wish or otherwise to directly input the entitlement "coordinates" of their desired contingent claim order; their wish or otherwise to mathematically specify an entitlement function reflecting their desired product order, where such functions can be single or multidimensional (indicating a contingent contract entitlement conditional on two or more phenomena); the "consideration/entitlement unit", "currency" (if applicable), and "national currency" (if applicable) in which they wish to "pay"/"receive" their contract consideration/entitlement. Where an ordering party wishes to mathematically specify their desired primary product order as a single-dimensional entitlement function: the input term " X" can indicate the number of contract entitlement " inflection points" the ordering party is seeking within the allowable range of future product event values (including the value range extremity points); the input term "Alpha (X)" can indicate the ordering party-specified event value corresponding to the Xth future product event value contract entitlement inflection point; the input term "Beta (X)" can indicate the ordering party-specified desired entitlement amount (in the desired "consideration/entitlement form", "currency" and "national currency" entitlement denomination) corresponding to the Xth event value inflection point; and the input term "Gamma (X-1)" can indicate the ordering party-specified desired shape of the function between each of the co-ordinates: [Alpha (1), Beta (1)] and [Alpha (2), Beta (2)], [Alpha (2), Beta (2)] and

[Alpha (3), Beta (3)], and so on (as applicable), where Gamma can represent all possible, mathematically definable, shapes.

Potential Counterparty Requirements

For their operation, CONTRACT APPS also require primary product "potential counterparty" stakeholders to a CONTRACT APP to define various parameters on the basis of which they can automatically price orders, including parameters with which they wish to establish a "consideration bid" on a defined product order; possible individual contract and product constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order; and possible expected-value product-portfolio constraints they require to be satisfied if they were to become a counterparty to a defined product ordering party order.

In defining parameters with which they wish to establish a "consideration bid" on a defined product order under a "EV-CE" pricing regime (described above), each potential counterparty is required to specify, amongst other things: an indicator of the appropriate "defined circumstances" of all possible product orders; a base "commission rate"; a base "discount rate"; (if applicable), a set of base "consideration/entitlement denomination", " currency" and "national currency" exchange rates; base "unit product prices"; and desired adjustments to the base commission rate, discount rate, exchange rates, and unit product prices on specific product orders according to the determined-value of the "defined circumstances" indicator (based on a specific product order).

Possible individual contract and product constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order, include: an absolute loss limit constraint (this constraint being specified as a single-figure constraint and/or as a function constraint); an expected loss limit constraint (this constraint defining the maximum "expected" aggregate loss the potential counterparty is prepared to incur on a contract/product, taking into account their assessment of the likelihood of all feasible future product values occurring); and a constraint on the maximum proportion of the expected total loss of the aggregate of the potential counterparty's contracts/products that can be accounted for by the expected loss of the defined individual contract/product. Similarly, possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they were to become a counterparty to a defined product ordering party order include the maximum (and possibly minimum) proportion of the expected total loss of the aggregate of the potential counterparty's product portfolio that can be accounted for by the expected loss of an individual contract/product.

Communications

CONTRACT APP stakeholders communicate with their applicable APP via AXSCO. Individual "stakeholder-to/from-AXSCO" communications can be by way of any/all of the following: voice communications with an AXSCO-linked "live operator" or "recorded messaging" system; touch-telephone communication with AXSCO directly; or computer-to-computer link with AXSCO (via a dedicated or dial-up communications line). With all three forms of communication, CONTRACT APP stakeholders may be required to utilize specified computer hardware and/or software mechanisms in their communications with AXSCO (including " payments" authorisation "black box" devices referred to below).

Component Processes

In their manifestation as telecommunications/ computer software residing on telecommunications/ computer hardware, individual CONTRACT APPS consist of a cluster of processes, utilizing a number of data files, residing on one or more processing units. A cluster of nine (and potentially more or fewer) specific processes and their related data files reside within a CONTRACT APP: a process, handling file administration and updating tasks supporting all other processes (termed Process 1); a process handling the receipt and processing of "primary" risk management contract transactions (termed Process 2); a process handling the receipt and processing of " secondary" risk management contract transactions (termed Process 3); a process handling the receipt and processing of "derivative-primary" risk management contract transactions (termed Process 4); a process handling the receipt and processing of "derivative-secondary" risk management contract transactions (termed Process 5); a process handling the "back office" management of all four types of risk management contract transactions (termed Process 6); a process handling non-transaction related consideration, entitlement, and other "payment" obligation transfers between stakeholders (termed Process 7); a process handling CONTRACT APP (and other INVENTCO) stakeholder access to specialist systems to assist these stakeholders decide how best to interface with the multiple aspects of INVENTCO (termed Process 8); and a process handling CONTRACT APP (and other INVENTCO) stakeholder access to a range of INVENTCO-facilitated "value added services" (termed Process 9). These processes may function concurrently.

Description of CONTRACT APP Processes

Process 1

Process 1 handles file administration and updating tasks supporting all other processes (FIG. 18). The PRODUCT, PRODUCT TRANS, DEAL LIST and DEAL LIST TRANS files referred to in FIG. 18 are applicable, individually or collectively, to primary, secondary, derivative-primary, and derivative-secondary contract orders. The SEL PRICE, SEL PRICE TRANS, SEL LIMIT and SEL LIMIT TRANS files are applicable only to primary and derivative-primary contract orders. The TRADE PRICE, TRADE PRICE TRANS, TRADE LIMIT and TRADE LIMIT TRANS files are applicable only to secondary and derivative-secondary contract orders.

The file administration and updating tasks handled by Process 1 comprise: dealing is with general data-file information received from CONTRACT APP stakeholders; dealing with general data-file and order processing information received from relevant other INVENTCO stakeholders, particularity VIRPRO and AXSCO; dealing with trading support information received directly from CONTRACT APP stakeholders; dealing with potential counterparty primary, and derivative primary, product order "consideration bid" parameters and order-match constraints; dealing with existing-contract offering party secondary, and derivative secondary, order match conditions; and dealing with miscellaneous information from entities external to INVENTCO.

Existing and prospective stakeholders are required to supply their applicable CONTRACT APP with specified identification and other information, and to continually maintain the integrity of this information. For each stakeholder, this information includes: applicable name(s), addresses, contact numbers, and references; their desired system access medium; their consideration/entitlement transfer entity account details; and, if applicable, their required schedule of fees and charges payable by other INVENTCO stakeholders. This information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

VIRPRO is required to supply the applicable CONTRACT APP with various forms of general data-file information including: identification data relating to the application promoter for (each) CONTRACT APP; details of the permitted types of system access mediums; and consideration/entitlement denominations available in each application. Again, this information is maintained in the data file ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

VIRPRO is similarly required to supply the applicable CONTRACT APP with various forms of general data-file information including: information on all data received by and sent from the various parts of INVENTCO to one another and to entities external to INVENTCO; and statistical information of various types, including data traffic volumes, data file location information and so on. This information is continuously collected by AXSCO and maintained in the data file HISTORY.

Trading support information received directly from CONTRACT APP stakeholders comprises stakeholder relationship information of a general nature, and specific information from individual stakeholders.

Stakeholder relationship information of a general nature comprises "transaction communication parameters" and automatic/manual deal and no deal flags". Transaction communication parameters are parameters set by all (registered) CONTRACT APP stakeholders defining the bounds within which they wish, for security reasons, all of their communications within INVENTCO to fall. Automatic/manual deal and no deal flags are "flags" set, as required, by all (registered) CONTRACT APP stakeholders indicating their requirements with respect to dealing with other CONTRACT APP stakeholders. This information is maintained in the data file DEAL LIST, updated information being received by way of the transaction file DEAL LIST TRANS.

Specific information from individual stakeholders differs according to the category of stakeholder involved.

Application promoters provide, amongst other things: information for the data file, PRODUCT (updated transactions being received from the file, PRODUCT TRANS), and further information for the data file ADMIN (updated transactions being received from the file, ADMIN TRANS). Information for the data file, PRODUCT includes details of the specific products application promoters offer for trading/exchange/transfer. Information for the data file, ADMIN includes: the order pricing and matching process upon which the application is based; the consideration/entitlement "value date" regime upon which their application is based; the categories of other stakeholders allowed to participate in the application and the conditions under which they can do this; the specific rules of engagement of counterparty-guarantors by potential counterparties; the availability and, in turn, the terms and conditions for CONTRACT APP stakeholder utilization of "consideration credit", "collateralisation", and "netting" features of the application (embodied in the various post-order-processing management routines); and details of the consideration/entitlement transfer entities involved in the application and relevant security information concerning account access.

Product sponsors provide full details of the product(s) they are sponsoring; product ordering parties and potential counterparties (collectively) indicate, with respect to each other, the parties they either prefer to deal with or wish to deal with exclusively. Potential counterparties (exclusively) provide a variety of specific information, including: details of the Application promoter, Product sponsor, and Counterparty-guarantor rules under which they have chosen to operate; data recording the lines of credit (if any) offered to ordering parties and the general and specific terms and conditions of these credit lines (applicable to ordering parties individually and/or to defined classes of ordering parties); parameters with which a potential counterparty wishes to determine its consideration "bids" on orders. Counterparty-guarantors provide details of the potential counterparties (if any) they have agreed to guarantee and the nature of such guarantees. Regulators provide details of: all entities having a stake in the application and their relationships to one another (for example, which counterparty-guarantors cover which counterparties, which potential counterparties offer which products, and so on);

specific regulations developed for the regime; and parameters defining the taxation treatment of all types of orders and related transactions. Consideration/entitlement transfer entities provide "set-up" and on-going account access and balance-updating services. All of the above-described information is maintained in the data file, ADMIN, updated information being received by way of the transaction file ADMIN TRANS.

In dealing with potential counterparty primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required, amongst other things, to: define various parameters with which they wish to establish a consideration bid on a defined product order; and define parameters with which the potential counterparty wishes to determine adjustments to the "base-price" bids on product orders according to the specific ordering party involved (this information is maintained in the data file SEL PRICE; updated information is received by way of the transaction files SEL PRICE TRANS); define possible individual contract and product constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order; and define possible expected-value product-portfolio constraints the potential counterparty requires to be satisfied if they are to become a counterparty to a defined product ordering party order (these latter two categories of information are maintained in the data files SEL LIMIT and BUY LIMIT; updated information being received by way of the transaction file SEL LIMIT TRANS).

In dealing with existing-contract offering party secondary order match conditions, offering parties are required, amongst other things, to specify: the Order IDs of the contracts in which the entity concerned wishes to "sell" its position as a contract stakeholder, and, for each such contract, the pricing and other parameters it requires to be satisfied before a contract position "sale" is effected. This information is maintained in the data file TRADE PRICE; updated information is received by way of the transaction file TRADE PRICE TRANS.

In dealing with potential counterparty derivative-primary product order "consideration bid" parameters and order-match constraints, potential product order counterparties are required to provide essentially the same information described above in relation to primary product orders. However, in addition, information directly applicable to the relevant type of derivative-primary transaction concerned (say, an option to establish a primary product order at a later date) is also required.

In dealing with existing-contract-offering party derivative-secondary order match conditions, offering parties are required to provide essentially the same information described above in relation to secondary product orders. However, in addition, information directly applicable to the relevant type of derivative-secondary transaction concerned (say, an option to sell a position in a primary product order at a later date) is also required.

In dealing with miscellaneous information from entities external to INVENTCO, this information can be of any type and may, potentially, be used by any part of INVENTCO; the information is maintained in the data-file ADMIN with updated information being received by way of the transaction file ADMIN TRANS

Process 2

Process 2 handles the receipt and processing of "primary" risk management contract transactions, such transactions being of multiple types. Various sub-processes of Process 2 handle the receipt and processing of all possible types of these transactions, including product order processing, price quote requests, and withdrawals of existing product orders.

Primary "product orders" constitute the core "primary" risk management contract transaction type (FIG. 19 provides a summary flow chart, and the document text provides a detailed flow chart and description of the processing of this transaction type).

Primary product orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of a single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the term "Beta (X)", the term "Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is prepared to "pay" for their defined product;

miscellaneous other dimensions of the ordering party's needs, and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received). Upon its receipt, all of this information is written to—and subsequently processed from—the file PORD NEW.

Three sub-processes are involved in processing primary product orders—order authorisation, order matching, and matched order confirmation. In the case of the anticipated most typical form of order, termed a "normal-automatic" primary product order these sub-processes function as follows:

The primary product order authorisation sub-process verifies that all orders contain data appropriate to the product being sought and that each ordering party is accurately identified and credentialled (this sub-process draws principally on the data-file, PPRODUCT).

The primary product order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential-counterparties, individual potential-counterparty "pricing" calculations, and counterparty selection.

The "short-listing of potential counterparties" sub-process component establishes a list of potential counterparties (if any) willing to offer the product sought by the ordering party, upon their receipt from the ordering party of a consideration they deem to be appropriate (this sub-process draws principally on the data-file, PDEAL LIST.

The individual potential-counterparties pricing calculations sub-process component utilises the above-described pricing parameters pre-specified by each short-listed potential counterparty to calculate the "bid" each of them is prepared to make on the ordering-party's product order (or part thereof), and to add these to the potential counterparties short-list file (this sub-process draws principally on the data-file, PSEL PRICE).

The "counterparty selection" sub-process component extracts from the above-described "potential-counterparties short-list" file the best possible counterparty(ies) for the ordering party's transaction, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and the price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched order is deemed to be in existence (this sub-process draws principally on the data-file, PSEL LIMIT).

The matched order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the contract, including confirmation of the product ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required contract consideration (and possible other applicable fees). Automatic approvals of contracts are made by the CONTRACT APP electronically transferring resources recorded in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty

(See Appendix H for a description of the consideration/entitlement "payment" process). In turn, automatic updates of the counterparty's matching constraints maintained in the file PSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, PORD QUEUE, for subsequent match attempts; matched and confirmed order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the file PORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process drawing principally on the data-file, ADMIN), records of this being written to the file PORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 3

Process 3 handles the receipt and processing of "secondary" risk management contract transactions. Like "primary" risk management contracts, "secondary" risk management contracts are of multiple types; various sub-processes of Process 3 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

"Secondary product orders" constitute the core "secondary" risk management contract transaction type (FIG. 20 provides a summary flow chart of the processing of this transaction type).

"Secondary" product orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract; the potential acquiring party's interest or otherwise in being granted credit by offering parties for the yet-to-be-determined contract acquisition amount; the acquiring party's interest or otherwise in availing themselves of the possible netting and other features of the APP concerned; the acquisition "price" range within which the potential acquiring party is prepared to "pay" for the contract they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file SORD NEW.

Three sub-processes are involved in processing secondary product orders—order authorisation, order matching, and matched order confirmation. In the case of the anticipated most typical form of order, termed a "normal-automatic" secondary product order these sub-processes function as follows:

The secondary product order authorisation sub-process verifies that all orders contain data appropriate to the contract sought and that each potential acquiring party is accurately identified and credentialled (this sub-process draws principally on the data-file, SPRODUCT).

The secondary product order matching sub-process locates sought-after contract records and, based on the contents of these records, determines whether a "sale" of the position of the specified stakeholder in the contract to the potential acquiring party is possible—in particular, whether the acquisition "price" range within which the potential acquiring party has specified it is prepared to "pay" for the position of the specified current stakeholder is equal to, or in excess of, the "allowable sale price" figure prespecified by the applicable contract stakeholder. If a contract "sale" is found to be possible, and there being no requirements for manual-approval intervention by any relevant stakeholder, a "match" is deemed to have occurred.

The secondary product matched order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the contract position "sale", including confirmation of the contract acquiring party's ability to immediately pay (or be granted current stakeholder credit, or acquiring party guarantor credit, for) the required "sale price" consideration (and possible other applicable fees). Automatic approvals of such "sales" are made by the CONTRACT APP electronically transferring resources recorded in the acquiring party's applicable consideration/entitlement transfer entity account to the account of the applicable current contract stakeholder.

Upon completion of the above-described processing steps: unmatched order transactions are written to the file, SORD QUEUE, for subsequent match attempts; matched and confirmed order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN), required records being written to the file SORD CONF for further "back-office" processing as required; and rejected order transactions are similarly notified to the relevant CONTRACT APP stakeholders (again, this process drawing principally on the data-file, ADMIN), required records being written to the file SORD REJ for further "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

Process 4

Process 4 handles the receipt and processing of "derivative-primary" risk management contract transactions. Like "primary" risk management contracts, "derivative-primary" risk management contracts are of multiple types; various sub-processes of Process 4 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and existing product order withdrawals.

"Product option orders" is one illustrative "derivative-primary" risk management contract transaction type (FIG. 21 provides a summary flow chart of the processing of this transaction type).

"Derivative-primary" product option orders incorporate the following key items of information: ordering party identification information; CONTRACT APP application and product identification information; "other stakeholder involvement" information; the ordering party's desired form of product specification (directly input as entitlement coordinates or as mathematical function(s)); when the order specification is by way of a single-dimensional mathematical function, the parameters of such a function (which can include: the term "X", the term "Alpha (X)", the term "Beta (X)", the term "Gamma (X-1)"; the contract consideration and entitlement "denomination type", "currency (if applicable)" and "national currency (if applicable)"; the ordering party's interest or otherwise in being granted credit by potential counterparties for the yet-to-be-determined contract option consideration amount; the ordering party's interest or otherwise in availing themselves of the possible netting and collateralisation features of the APP concerned; the consideration "price" range within which the ordering party is prepared to "pay" for their defined product option; miscellaneous other dimensions of the ordering party's needs, and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant "payments" made/received). Upon its receipt, all of this information is written to—and subsequently processed from—the file DPORD NEW.

Three sub-processes are involved in processing derivative-primary product orders order authorisation, order matching, and matched order confirmation. In the case of the most likely form of the above-mentioned illustrative option order, termed a "normal-automatic" derivative-primary product option order these sub-processes function as follows:

The primary product option order authorisation sub-process verifies that all orders contain data appropriate to the product option being sought and that each ordering party is accurately identified and credentialled (this sub-process draws principally on the data-file, DPPRODUCT).

The primary product option order matching sub-process locates the best possible counterparty(ies) for the ordering party's transaction according to the application promoter-specified "matching rules" embodied in the APP; it does this utilizing three component sub-processes, termed: short-listing of potential option-counterparties, individual potential option-counterparty "pricing" calculations, and option-counterparty selection.

The "short-listing of potential option-counterparties" sub-process component establishes a list of potential option-counterparties (if any) willing to offer the product option sought by the ordering party, upon their receipt from the ordering party of an option consideration they deem to be appropriate (this sub-process draws principally on the data-file, DPDEAL LIST).

The "individual potential option-counterparties pricing calculations" sub-process component utilises the above-described pricing parameters prespecified by each short-listed potential option-counterparty to calculate the "bid" each of them is prepared to make on the ordering-party's product option order (or part thereof), and to add these to the potential option-counterparties short-list file (this sub-process draws principally on the data-file, DPSEL PRICE).

The "option-counterparty selection" sub-process component extracts from the above-described "potential option-counterparties short-list" file the best possible counterparty(ies) for the ordering party's transaction, according to the application promoter-specified "matching rules" embodied in the APP, taking into account whatever matching constraints all applicable APP stakeholders may have prespecified. This selection being made, and the price bid being within the allowable limits specified by the ordering party, and there being no requirements for manual-approval intervention by any relevant stakeholder, a matched option order is deemed to be in existence (this sub-process draws principally on the data-file, DPSEL LIMIT).

The matched option order confirmation sub-process effectively secures, automatically, the positive agreement of all affected stakeholders to the options contract, including confirmation of the product-option-ordering party's ability to immediately pay (or be granted counterparty credit, or ordering party guarantor credit, for) the required option product consideration (and possible other applicable fees). Automatic approvals of contracts are made by the CONTRACT APP electronically transferring resources recorded in the ordering party's applicable consideration/entitlement transfer entity account to the account of the applicable counterparty. In turn, automatic updates of the option-counterparty's matching constraints maintained in the file DPSEL LIMIT are made.

Upon completion of the above-described processing steps: unmatched option-order transactions are written to the file, DPORD QUEUE, for subsequent match attempts; matched and confirmed option-order transactions are confirmed to the relevant CONTRACT APP stakeholders (this process drawing principally on the data-file, ADMIN) and are written to the reference file DP MSTR, and the file DPORD CONF for subsequent "back-office" processing; and relevant CONTRACT APP stakeholders are notified of rejected orders (again, this process drawing principally on the data-file, ADMIN), records of this being written to the file DPORD REJ for subsequent "back-office" processing. A copy of all processing outputs is written to the file, HISTORY.

If/when an option-holder wishes to exercise its option over a pre-established contract, it does so by appropriately notifying the CONTRACT APP which, in turn, retrieves the contract record from DPMSTR, effects the necessary additional consideration payments, and writes a new record to PORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 5

Process 5 handles the receipt and processing of “derivative-secondary” risk Management contract transactions. Like “secondary” risk management contracts, “derivative-secondary” risk management contracts are of multiple types; various sub-processes of Process 5 handle the receipt and processing of all possible types of these transactions, including product order processing, product price indications, and withdrawals of existing product orders.

“Product option orders” is an illustrative “derivative-secondary” risk management contract transaction type (FIG. 22 provides a summary flow chart of the processing of this transaction type).

“Derivative-secondary” product option orders incorporate the following key items of information: potential acquiring party identification information; the pre-established Order ID reference to the sought-after primary contract (in relation to which an option is to be purchased or sold); the potential acquiring party's interest or otherwise in being granted credit by offering parties for the yet-to-be-determined option contract acquisition amount; the acquiring party's interest or otherwise in availing itself of the possible netting and other features of the APP concerned; the acquisition “price” range within which the potential acquiring party is prepared to “pay” for the contract option they have specified; other dimensions of the potential acquiring party's needs; and the consideration/entitlement transfer entity accounts from which/to which they wish to have relevant “payments” made/received. The above-described information is, upon receipt, written to—and subsequently processed from—the file DSORD NEW.

The subprocesses involved in the processing of derivative-secondary product option orders are essentially a combination of the processes described above in the case of secondary product orders (Process 3) and derivative-primary product option orders (Process 4). At the completion of the matching process, matched orders are written to the reference file DSMSTR and the file DSORD CONF for subsequent back office processing.

If/when an option holder wishes to exercise its option over a pre-established contract, it does so by appropriately notifying the CONTRACT APP which, in turn, retrieves the contract record from DSMSTR, effects the necessary additional consideration payments, and writes a new record to SORD CONF for subsequent back office processing. As described above, the appropriate HISTORY and other files are updated in this process.

Process 6

Process 6 handles the "back office" management of "matched/confirmed" primary, secondary, derivative-primary, and derivative-secondary risk management contract transactions and transactions handled by Processes 7-9. The process incorporates multiple subprocesses, collectively accessing multiple data files (FIG. 23): primary risk management contract back office processing; secondary risk management contract back office processing; derivative-primary risk management contract back office processing; derivative-secondary risk management contract back office processing; "Process 7" transactions back office processing; "Process 8" transactions back office processing; and "Process 9" transactions back office processing.

In relation to the back-office management of confirmed/matched primary risk management contracts—a number of sub-processes are involved, including: Receipt of the previous operating day's "matured-contract actual product event value" sub-process; "Start-of-day PAYACC management" sub-process; Contract maturity management sub-process; Confirmed contract processing sub-process; Information compilation and distribution sub-process; Information extraction from primary orders sub-process; Contract valuation sub-process; Contract collateralisation payments sub-process; System Access and usage fee determination and payments sub-process; Bilateral obligations netting sub-process; Multilateral obligations netting sub-process; Bilateral payments netting sub-process; Multilateral payments netting sub-process; and "end-of-day PAYACC management" sub-process.

Receipt of the previous operating day's "matured-contract actual product event value" details. This sub-process is flowcharted in FIG. 24; it involves the applicable CONTRACT APP receiving "matured-contract actual product event value" details from the relevant product sponsors (external to INVENTCO). The primary data-file, MAT PROD VALUES, is updated with this information. The support data-files, ADMIN, HISTORY, and INFO are similarly updated with applicable information.

"Start-of-day" PAYACC management. This sub-process is flowcharted in FIG. 25; it involves the applicable CONTRACT APP receiving consideration/entitlement "actual account" opening-balances from participating consideration/entitlement transfer entities (external to INVENTCO) (see Process 7 for details). The primary data-files, PAYACC SHADOW and PAYACC FINAL are updated with this information. The support data-files, HISTORY, INFO and ADMIN, are similarly updated with applicable information.

Contract maturity management. This subprocess is flowcharted in FIG. 26; it involves the applicable CONTRACT APP determining and giving effect to primary and related entitlement-transfers to/from applicable CONTRACT APP stakeholders, applicable other INVENTCO stakeholders, where such transfers are principally reflected in entries to the data-file, PAYACC SHADOW. CONTRACT APP determines and gives effect to these transfers, principally by drawing upon product/contract information maintained in the data files, INTREG, MAT PROD VALUES, COLLAT, CREDIT MGMT, BILAT OBLIG NET, and MULTILAT OBLIG NET. These data-files are appropriately updated in the process as are the support data-files, ADMIN, HISTORY, TAX/SUB, PAYACC SHADOW and INFO.

Confirmed contract processing. This sub-process, flowcharted in FIG. 27, operates continually throughout each operating day. Details of new matched/confirmed contracts are read from the file PORD CONF and are then time-stamped and written to the file INTREG as two records—one record pertaining to the contract ordering party and the other to the contract counterparty. The support data files, INFO, ADMIN, and HISTORY are appropriately updated in the process.

Information compilation and distribution. This sub-process, flowcharted in FIG. 28, operates continually (beyond a defined operating day), drawing on the data-file INFO. As already described, INFO is updated continually as CONTRACT APP and other INVENTCO events occur, including pertinent AXSCO message information written in the first instance to HISTORY. All relevant INVENTCO stakeholders have access to preauthorised parts of INFO.

Information extraction from primary orders. This sub-process, flowcharted in FIG. 29, is effected after the completion of the defined operating day. Essentially, it involves the single task of processing the data-file, HISTORY, to yield pertinent information for the data-file INFO. One of the most important items of information drawn from HISTORY is (confidential) information on all of the prior day's potential counterparty consideration bid parameters, in particular the data items termed "assessed probabilities of occurrence". This information yields "market" information for the subsequent contract valuation sub-process.

Contract valuation. This sub-process, flowcharted in FIG. 30, draws principally upon the above-described "markets" information previously written to INFO. Pertinent data from this file is "applied against" all outstanding contracts maintained in INTREG, thereby yielding updated "future product value (FPV)", "expected value" and "distribution" value information for all contracts and, from this, revaluations of all future entitlement "expected values" and "distribution" values. All these revaluation figures are maintained in INTREG with applicable information also being written to INFO and HISTORY.

Contract collateralisation payments. This sub-process, flowcharted in FIG. 31, draws principally on the data-file INTREG. Following the contract valuation process, this collateralisation process involves relevant INTREG records being read and, depending (amongst other things) on the precalculated "present value" of the expected future entitlement associated with each relevant contract, a calculated portion of the present value of the expected future consideration amount is debited or credited to the PAYACC SHADOW file of the applicable collateralisation trustee entity, and the product ordering party and/or counterparty as is applicable.

Generally, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a negative contract value, and if this negative value exceeds the prior contract valuation figure, the applicable entity's trust account is credited with the funds difference, with the entity's own consideration/entitlement transfer entity account being debited correspondingly. If this negative value does not exceed the prior contract valuation figure, the applicable entity's trust account is debited with the funds difference, with the entity's own consideration/entitlement transfer entity account being credited correspondingly. On the other hand, if the most recent precalculated "present value" of the expected future entitlement associated with each relevant contract indicates a positive contract value, the only collateralisation payment adjustment called for is one in which all funds (if any) in the applicable entity's trust account are transferred to the entity's own consideration/entitlement transfer entity account. In each of the above-described cases, a record of all entries effected is written to the data-file, COLLAT, and a subset of this information is written to the data-files HISTORY and INFO.

System Access and usage fee determination and payments. This subprocess, flowcharted in FIG. 32, deals with the determination and payment of system access and usage fees (as distinct from contract maturity date fee payments). The function draws principally on the data-files ADMIN, and HISTORY. Fee payment parameters are maintained in data-file ADMIN. These parameters are applied against the day's new records already written to HISTORY. Debits and credits for fees so determined are written to PAYACC SHADOW with summary information written to INFO and HISTORY.

Bilateral obligations netting. This subprocess, flowcharted in FIG. 33, effectively maintains an up-to-date matrix of the present values of expected future entitlement (and other) obligations between pairs of participating ordering parties and counterparties (as well as other participating CONTRACT APP and INVENTCO stakeholders), continually adjusted on the basis of required current consideration, entitlement and other payments/receipts as they occur. As required, the function updates the above-described matrix in two stages. First, with the most recent contract revaluation figures contained within INTREG. And second, with the end-of-day payment/receipt amounts contained within PAYACC SHADOW. Consideration/entitlement transfer entity transfers from/to applicable entities are determined (according to the application-promoter specified parameters for so doing) on the basis of whether or not any/all of the adjusted bilateral present value figures are in excess of their allowable limits. These entries are written to PAYACC SHADOW, with the data-files BILAT OBLIG NET, INTREG, HISTORY, and INFO being subsequently updated.

Multilateral obligations netting. This subprocess, flowcharted in FIG. 34, is essentially the same as the bilateral netting function except that a specified "clearing/trustee" entity is effectively interposed between all bilateral counterparties and, as such, netted obligations are only between the specified "clearing house/trustee" entity and each participating entity.

Bilateral payments netting. This subprocess, flowcharted in FIG. 35, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bilaterally netted payments/receipts based on records contained in the data-file, PAYACC SHADOW. Single netted payment/receipt figures are then rewritten to PAYACC SHADOW, with the data-files BILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

Multilateral payments netting. Like bilateral payments netting, this subprocess, flowcharted in FIG. 36, is independent of the above-described bilateral and multilateral obligations netting subprocesses. The subprocess operates by producing a matrix of bilaterally netted payments/receipts to/from the applicable "clearing house/trustee" entity based on records contained in the data-file, PAYACC SHADOW. Single netted payment/receipt figures (to/from the "clearing house/trustee" entity) are then rewritten to PAYACC SHADOW, with the data-files MULTILAT PYMTS NET, ADMIN, HISTORY and INFO being subsequently updated.

"End-of-day" PAYACC management. This subprocess, flowcharted in FIG. 37, involves a three-stage process. First, the preparation of inter-consideration/entitlement transfer entity "balancing" transactions. Second, the transfer of the final contents of the PAYACC SHADOW data-file to the data-file, PAYACC FINAL. And third, the electronic transmission of the contents of PAYACC FINAL to the applicable consideration/entitlement transfer entities (external to INVENTCO). In turn, the subsidiary data-files, ADMIN, HISTORY, and INFO are updated.

Process 7

Process 7 handles non-CONTRACT APP-related obligation transfers between applicable INVENTCO stakeholders, that is, the transfer of ownership title over "assets" registered by INVENTCO—typically matched/confirmed contracts (recorded as CONTRACT APP INTREG records) and consideration/entitlement transfer entity resources (recorded as PAYACC records). Both of the above-mentioned items have value to their holder. This process enables holders of these items to assign or lend any portion of their holdings to others at their will through initiating the appropriate transactions as NCAROT TRANS. The process accesses a relatively small number of data files (See FIG. 38). NCAROT TRANS received result in appropriate updates to the primary data-files, PAYACC SHADOW and INTREG. In turn, the subsidiary data files, HISTORY, ADMIN and INFO are updated.

Process 8

Process 8 (flowcharted in FIG. 39) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to specialist systems to assist them decide how best to interface with one or more aspects of INVENTCO. In the case of CONTRACT APP stakeholders, the most likely users of this process, one collection of such specialist systems are termed "decision support systems". The purpose of these systems is to guide a user-stakeholder as to how it should react to/deal with the continually changing circumstances within the CONTRACT APP with which they are dealing. Different clusters of systems are applicable for different CONTRACT APP stakeholders. These systems involve a hierarchy of potentially any number of value-added components.

An example of one such system, useful to primary product ordering parties, is a system which helps an ordering party determine which of its prespecified, but as yet un-matched, orders it should withdraw and which of its potential new product orders it should submit. This system is in the form of a "utility optimization" mechanism which seeks to identify the best possible composition of outstanding orders (and thus, which existing, unmatched orders should be withdrawn and which new orders should be submitted) based on two things. First, an objective function which seeks to minimize the difference between a weighted sum of actual and desired values of a series of attributes (involving single or multiple products, covering the ordering party's "real business exposure" to each product, the ordering party's portfolio of contracts which have been "matched" but are not yet confirmed, orders which have been submitted but not yet matched, and potential yet-to-be-submitted orders (collectively termed the "buyer's objective portfolio"), these attributes including, amongst other things: the "expected value" of the objective portfolio; the "standard deviation" of the objective portfolio; the "incremental cash outflow" attribute of the objective portfolio; the "maximum absolute loss" attribute of the objective portfolio; the "expected loss" attribute of the objective portfolio; the "implied minimum return on investment" of the objective portfolio; and the "implied expected return on investment" of the objective portfolio. And second, a series of constraints specifying, amongst other things: the required "minimum values" of each objective function attribute; and required minimum product-shares in the ordering party's overall product portfolio. The mathematical form of this "optimization" could take any of a number of alternative forms.

An optimization mechanism similar to the one described above can also aid potential counterparties in defining their pricing parameters for application against incoming product orders.

Effectively, systems of the above-described type are collectively maintained as a software "library" within the applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entities independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, SSA TRANS. These requests result in the appropriate records in the file SSA being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link to INVENTCO. Appropriate records of the utilization of SSA records are written to the data-files HISTORY, ADMIN and INFO.

Process 9

Process 9 (flowcharted in FIG. 40) handles CONTRACT APP (and other INVENTCO) stakeholder shared-access to a range of INVENTCO-facilitated value added services. These services can include: accounting, reconciliation, and information services; value added information reseller services; financial services of multiple types; and data processing and telecommunications services. Effectively, software relating to these services is maintained as a software "library" within the applicable CONTRACT APP (although they may also be loaned by VIRPRO-authorised entities independent of INVENTCO and/or acquired by VIRPRO-authorised parties whether they are INVENTCO stakeholders or not). CONTRACT APP (and other INVENTCO) stakeholder requests to make use of software within this library are received by way of records in the file, VAS TRANS. These requests result in the appropriate records in the file VAS being accessed and made available for use via AXSCO and the applicable entity's authorised electronic link with INVENTCO. Appropriate records of the utilization of VAS records are written to the data-files HISTORY, ADMIN and INFO.

Process 2 Variables and Data Files

Listed below is the file name and description therefor.

Order Data Fields

OID Unique identification assigned by CONTRACT APP to every new order submitted.

BID Ordering party identification.

BREF Ordering party's own reference for this order.

PID Order field specifying the required product.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from. Implied is the account consideration/entitlement, currency, national currency.

ACC ENTITL The ordering party account the contract entitlement is to be paid into. Implied is the account consideration/entitlement, currency, national currency.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining un-matched.

OPRICE Price calculated and selected for this order (this value will be the matching price).

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

DCID Defined circumstances identification.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements.

Counterparty Short List Arrays

PRICEFUNC(SID) Pricing function: function type and associated parameters.

ELFUNC(SID) Expected loss determination function: function type and associated parameters.

EVFUNC(SID) Expected value determination function: function type and associated parameters.

CR(SID) Commission rate to be used for the current defined circumstances.

DR(SID) Discount rate to be used for the current defined circumstances.

PRICE(SID) Price calculated by each counterparty.

EL(SID) Expected loss calculated for the current order by each counterparty.

AL(SID) Absolute loss calculated for the current order by each counterparty.

EV(SID) Expected values determined for the current order by each counterparty.

MCC(SID) Maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC(SID) Maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1(SID) Order expected loss limit.

ELL2(SID) Expected loss limits set by the counterparty for the product.

ELL3(SID) Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4(SID) Expected loss limits set by the counterparty for same month maturity products.

ELL5(SID) Expected loss limits set by the counterparty for orders in all products.

CEL2(SID) Current accumulated expected losses for the product.

CEL3(SID) Current accumulated expected losses for equivalent maturity date products.

CEL4(SID) Current accumulated expected losses for same month maturity products.

CEL5(SID) Current accumulated expected losses for orders in all products.

ALL1(SID) Absolute loss limit function for each contract.

ALL2(SID) Absolute loss limit function set for the product.

CAL2(SID) Current absolute limit function accumulated for the product.

EVL1(SID) Expected value limit on each order.

C-C/EDXCHANG(SID) Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG(SID) Counterparty currency exchange rates which covert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG(SID) Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC ENTITL into the product's consideration denomination.

E-CXCHANG(SID) Counterparty currency exchange rates which covert the ordering party's currency of ACC ENTITL into the product's denominated currency.

E-NCXCHANG(SID) Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

Miscellaneous Variables

BPRICE Best price selected from the PRICE(SID) array.

SID The currently selected or viewed counterparty identification.

INDEX Index counter variable required for calculating order prices.

P1 Value calculated by a pricing function at an index point.

P2 Value calculated by a pay-off function at an index point.

Master Files

File Description/Contents

PORD NEW Holds details of all new orders submitted by ordering parties:

BID Ordering party identification.

BREF Ordering party's own reference for this order.

PID Order field specifying the required product.

MAXCONSID Maximum consideration the ordering party will pay for this contract.

PAYFUNC Pay-off function type, contingent on one or more index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering party account the consideration is to be paid from.

ACC C/ED The ordering party account consideration/entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

ACC ENTITL The ordering party account the contract entitlement is to be paid into.

RET LIM Retention time limit for the order, which sets an expiration time for the order whilst remaining unmatched.

OANON Anonymous flag, set by the ordering party when seeking to avoid manual authorisation requests by other stakeholders.

OMANUAL Manual authorisation request flag. If set, the ordering party requires manual authorisation before the matched order is fully confirmed.

DTID Deal type identification which codes a combination of miscellaneous flags such as collateralisation, bilateral and multilateral netting requirements.

PORD QUEUE This master file holds details of orders which have already been authorised, and have attempted to match once before. Fields as in ORD NEW plus some additional fields:

OID Unique identification assigned by P-CONTRACT to every new order submitted.

PMAT Product maturity date.

C/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

DCID Defined circumstances identification.

PORD REJ All rejected orders reside in this file. Fields as in ORD QUEUE plus some additional fields:

ERRCODE Error code indicating why the order was rejected.

PORD CONF When an order is matched and fully confirmed, full details are stored in this master file. Fields as in ORD QUEUE plus some additional fields:

OPRICE Price calculated and selected for this order. This value will be the matching price.

SPRICE Counterparty identification with which the order was matched.

PAY TRAN Payment transaction number.

PPRODUCT This master file holds information (definition details) about each product known to the system:

PID Product identification.

PMAT Product maturity date.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PPARAM Product specification parameters (eg. minimum value (PMIN), maximum value (PMAX), and the step size (PSTEP)).

PDEAL LIST This file holds a list of the ordering party/product/counterparty tuples of allowable deals to occur. Thus by specifying an ordering party (BID) and product (PID), a list of counterparties who are prepared to enter into a deal with the ordering party/product combination, can be obtained:

BID Ordering party identification

PID Product identification

SID Counterparty identification

ANON All stakeholder identifications requiring anonymous confirmation.

MANUAL All stakeholder identifications requiring manual authorisation

PSEL DC This file allows counterparties to define identifications for sets of potential order parameters.

Any order data field can be used to define an order.

Each defined circumstance identification is then used to set unique pricing parameters:

DCID Defined circumstances identifications.

BID Ordering party identification

PAYFUNC Pay-off function type, contingent on one or mere index variables.

PAYPARAM Parameters associated with the PAYFUNC.

ACC CONSID The ordering part account the consideration is to be paid from.

ACC ENTITL The ordering party account the contract entitlement is to be paid into.

DTID Deal type identification.

PC/ED Product consideration/entitlement denomination.

PCUR Product currency denomination.

PNCUR Product national currency denomination.

PSEL PRICE Contains all counterparty pricing parameters, including commission rates, discount rates and exchange rates:

SID Counterparty identification

PID Product identification

DCID Defined circumstances identification

PRICEFUNC Pricing function: function type and associated parameters.

CR Commission rate to be used for the current ordering party in the current product.

DR Discount rate to be used for the current ordering party in the current product.

C-C/EDXCHANG Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC CONSID (and MAXCONSID) into the product's consideration denomination.

C-CXCHANG Counterparty currency exchange rates which covert the ordering party's currency of ACC CONSID (and MAXCONSID) into the product's denominated currency.

C-NCXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC CONSID (and MAXCONSID) into the product's denominated national currency.

E-C/EDXCHANG Counterparty consideration/ entitlement denomination exchange rates which convert the ordering party's consideration denomination of ACC ENTITL into the product's consideration denomination.

E-CXCHANG Counterparty currency exchange rates which covert the ordering party's currency of ACC ENTITL into the product's denominated currency.

E-NCXCHANG Counterparty national currency exchange rates which convert the ordering party's national currency of ACC ENTITL into the product's denominated national currency.

PSEL LIMIT Holds all counterparty portfolio limits and current accumulated exposures in the various mathematical forms allowed by the system:

SID Counterparty identification

PID Product identification

DATE Product maturity date.

MCC Maximum composition any contract (as an expected loss) can have of the entire portfolio.

MC Maximum composition the product (as an expected loss) can have of the entire portfolio.

ELL1 Order expected loss limit.

ELL2 Expected loss limits set by the counterparty for the product.

ELL3 Expected loss limits set by the counterparty for equivalent maturity date products.

ELL4 Expected loss limits set by the counterparty for same month maturity products.

ELL5 Expected loss limits set by the counterparty for orders in all products.

CEL2 Current accumulated expected losses for the product.

CEL3 Current accumulated expected losses for equivalent maturity date products.

CEL4 Current accumulated expected losses for same month maturity products.

CEL5 Current accumulated expected losses for orders in all products.

ALL1 Absolute loss limit function for each contract.

ALL2 Absolute loss limit function set for the product.

CAL2 Current absolute limit function accumulated for the product.

EVL1 Expected value limit on each order.

PAYACC Payment accounts for all registered stakeholders (inc. balances and previous SHADOW transactions), are stored in this master file:

ID Stakeholder identification.

NO Account number.

ACC C/ED The ordering party account consideration/entitlement.

ACC CUR The ordering party account currency.

ACC NCUR The ordering party account national currency.

BALANCE Available funds.

GID Stakeholder identification guaranteeing the account.

Risk Management Contracts

Risk management contracts is a term used to refer to one type of contractual obligation which can be, but does not need to be, traded/exchanged/transferred, and subsequently processed and settled, using an INVENTCO system. Risk management contracts consist of "primary" risk management contracts; "secondary" risk management contracts; "derivative-primary" risk management contracts; and "derivative-secondary" risk management contracts.

“Primary” risk management contracts can be “simple” and “complex” in nature (“ simple” contracts being derivatives of “complex” contracts).

A “simple” primary risk management contract is a tradeable or untradeable contract conveying an obligation on an entity, upon that entity being granted a consideration by another entity (or accepting a pledge to be granted a consideration by the other entity), to make an entitlement to that other entity depending on the value of a defined phenomenon, determined at a defined time in the future.

A “complex” primary risk management contract is a tradeable or untradeable contract conveying an obligation on either or both of two entities, upon one entity [usually] being granted a consideration by the other entity (or accepting a pledge to be granted a consideration by the other entity), to make an entitlement to pay/receive an entitlement from one another, depending on the value of a defined phenomenon, determined at a defined time in the future. A “complex” contract may, in turn, be “basic” or “advanced” in nature: a “complex-basic” contract being one that does not involve ordering party and/or matched order counterparty “collateralisation payments” to a third-party trustee or clearing entity during the life of a contract; and a “complex-advanced” contract being one that does involve ordering party and/or matched order counterparty “collateralisation payments” to a third-party trustee or clearing entity during the life of a contract.

“Secondary” risk management contracts are pre-existing “primary” risk management contracts offered for trade (individually or as a portfolio) by a “risk-counterparty” stakeholder to the underlying contract.

"Derivative-primary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on specified, but yet-to-be-established, primary risk management contracts.

"Derivative-secondary" risk management contracts are options contracts, or futures contracts, or forward contracts, or forward rate agreements, or swaps, or like financial instruments based on pre-existing primary risk management contracts (which may have been traded since they were first established), including instruments based on: specified, but yet-to-be established, secondary risk management contracts; and the intended tertiary trading/exchange/transfer of specified, established, secondary risk management contracts.

I claim:

1. A data processing system to enable the exchange of an obligation between parties, the system comprising:

a first party device,

a data storage unit having stored therein

(a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and

(b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution;

and a computer, coupled to said data storage unit, that is configured to

(a) receive a transaction from said first party device;

(b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and

(c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

2. The data processing system of claim 1, wherein said first and/or second exchange institution is a central bank.

3. The data processing system of claim 2, wherein said exchange obligation involves currency.

4. The data processing system of claim 3, wherein said first exchange institution and said second exchange institution operate in different time zones.

5. The data processing system of claim 1, wherein said first exchange institution and said second exchange institution are the same.

6. The data processing system of claim 1, wherein said second account and said fourth account are the same account.

7. The data processing system of claim 1, wherein said exchange obligation involves currency.

8. The data processing system of claim 1, wherein said first and/or second exchange institution is a non-bank clearing house or depository.

9. The data processing system of claim 1, wherein adequate value requires that said first account and/or said third account have a positive balance.

10. The data processing system of claim 1, wherein said instruction to said first exchange institution and/or said second exchange institution represents adjustments to said first and/or said third account netted throughout a period of time.

11. The data processing system of claim 1, further comprising means for allowing said first party to acquire an item from said second party, wherein the exchange obligation relates to said item.

12. The data processing system of claim 1, further comprising a second party device, wherein said computer is further configured to receive a transaction from said second party device.

13. The data processing system of claim 12, wherein said first party device and said second party device include a computer.

14. A data processing system to enable the exchange of an obligation between parties, the system comprising:

a communications controller,

a data storage unit having stored therein

(a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and

(b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

a computer, coupled to said data storage unit and said communications controller, that is configured to

(a) receive a transaction from said first party via said communications controller;

(b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and

(c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

15. The data processing system of claim 14, wherein said first and/or second exchange institution is a central bank.

16. The data processing system of claim 15, wherein said exchange obligation involves currency.

17. The data processing system of claim 16, wherein said first exchange institution and said second exchange institution operate in different time zones.

18. The data processing system of claim 14, wherein said first exchange institution and said second exchange institution are the same.

19. The data processing system of claim 14, wherein said second account and said fourth account are the same account.

20 The data processing system of claim 14, wherein said exchange obligation involves currency.

21. The data processing system of claim 14, wherein said first and/or second exchange institution is a non-bank clearing house or depository.

22. The data processing system of claim 14, wherein adequate value requires that said first account and/or said third account have a positive balance.

23. The data processing system of claim 14, wherein said instruction to said first exchange institution and/or said second exchange institution represents adjustments to said first and/or said third account netted throughout a period of time.

24. The data processing system of claim 14, further comprising means for allowing said first party to

acquire an item from said second party, wherein the exchange obligation relates to said item.

25. The data processing system of claim 14, wherein said computer is further configured to receive a transaction from said second party via said communications controller.

26. A data processing system to enable the exchange of an obligation between parties, the system comprising:

a communications controller,

a first party device, coupled to said communications controller,

a data storage unit having stored therein

(a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and

(b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

a computer, coupled to said data storage unit and said communications controller, that is configured to

(a) receive a transaction from said first party device via said communications controller;

(b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and

(c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

27. The data processing system of claim 26, wherein said first and/or second exchange institution is a central bank.

28. The data processing system of claim 27, wherein said exchange obligation involves currency.

29. The data processing system of claim 28, wherein said first exchange institution and said second exchange institution operate in different time zones.

30. The data processing system of claim 26, wherein said first exchange institution and said second exchange institution are the same.

31. The data processing system of claim 26, wherein said second account and said fourth account are the same account.

32. The data processing system of claim 26, wherein said exchange obligation involves currency.

33. The data processing system of claim 26, wherein said first and/or second exchange institution is a non-bank clearing house or depository.

34. The data processing system of claim 26, wherein adequate value requires that said first account and/or said third account have a positive balance.

35. The data processing system of claim 26, wherein said instruction to said first exchange institution and/or said second exchange institution represents adjustments to said first and/or said third account netted throughout a period of time.

36. The data processing system of claim 26, further comprising means for allowing said first party to acquire an item from said second party, wherein the exchange obligation relates to said item.

37. The data processing system of claim 26, further comprising a second party device, wherein said computer is further configured to receive a transaction from said second party device via said communications controller.

38. The data processing system of claim 37, wherein said first party device and second party device include a computer.

39. A computer program product comprising a computer readable storage medium having computer readable program code embodied in the medium for use by a party to exchange an obligation between a first party and a second party, the computer program product comprising:

> program code for causing a computer to send a transaction from said first party relating to an exchange obligation arising from a currency exchange transaction between said first party and said second party; and

program code for causing a computer to allow viewing of information relating to processing, by a supervisory institution, of said exchange obligation, wherein said processing includes (1) maintaining information about a first account for the first party, independent from a second account maintained by a first exchange institution, and information about a third account for the second party, independent from a fourth account maintained by a second exchange institution; (2) electronically adjusting said first account and said third account, in order to effect an exchange obligation arising from said transaction between said first party and said second party, after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and (3) generating an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

40. The computer program product of claim 39, wherein said transaction involves currency.

41. The computer program product of claim 39, wherein said program code for causing a computer to allow viewing of information further includes only allowing access to preauthorized information relating to said processing.

42. The data processing system of claim 1, wherein said second and fourth accounts are different.

43. The data processing system of claim 1, wherein said information about a first account and said information about a third account includes a credit and debit account balance.

44. The data processing system of claim 14, wherein said second and fourth accounts are different.

45. The data processing system of claim 14, wherein said information about a first account and said information about a third account includes a credit and debit account balance.

46. The data processing system of claim 26, wherein said second and fourth accounts are different.

47. The data processing system of claim 26, wherein said information about a first account and said information about a third account includes a credit and debit account balance.

* * * * *

EXHIBIT 5

[SEAL]

UNITED STATES PATENT AND TRADEMARK OFFICE

United States Department Of Commerce
United States Patent and Trademark Office
Address: Commissioner For Patents
P.O. BOX 1450
Alexandria, Virginia 22312-1450

Application No.:	09/567,507
Filing Date:	05/09/2000
First Named Inventor:	Ian Kenneth Shepherd
Attorney Docket No.:	1033.0170002
Confirmation No.:	6891

STERNE, KESSLER, GOLDSTEIN &FOX PLLC
1100 New York Avenue, N.W.
Washington, DC 20005

Examiner	Snapp, Sandra S.
Art Unit:	3624
Paper Number:	#10

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/567,507	SHEPHERD, IAN KENNETH
Examiner	Art Unit
Sandra Snapp	3624

--The MAILING DATE of this
communication appears on the cover sheet
with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum. of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS born the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 07 March 2003.

2a)☐ This action is FINAL.

2b)☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*. 1935 CD. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 62-143 is/are pending in the application.

4a)Of the above clam(s)_____is/are withdrawn from consideration.

5) ☐ Claim(s)______is/are allowed.

6) ☒ Claim(s) 62-143 is/are rejected.

7) ☐ Claim(s) ______ is/are objected to.

8) ☐ Claim(s).______ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification Is objected to by the Examiner.

10)☒ The drawing(s) filed on 01 May 2001 is/are:
a) ☒ accepted or

b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance, See 37 CFR 1.55(a).

11)☐ The proposed drawing correction filed on ______ is: a) ☐ approved b) ☒ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action. 12)0 The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120 •

13)☒ Acknowledgment is made of a Claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some c) ☒ None of:

1. ☒ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received In Application No.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (td a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5,7,11.
4) ☐ Interview Summary (PTO-413) Paper No(s) ______
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

* * * *

Application/Control Number: 09/567,507

Art Unit: 3624

DETAILED ACTION

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 4-27-01, 4-16-02, 12-30-02 and 3-11-03 were filed in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner.

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Australia on 5-29-92, 6-30-92, 12-7-94 and 7-7-95. It is noted, however, that applicant has not filed a certified copy of the Australian applications as required by 35 U.S.C. 119(b).

Drawings

The formal drawings were received on 4-27-01. These drawings are acceptable.

Specification

The abstract of the disclosure is objected to because it does not comply with the required format of 50 to 150 words, it is not written as a single paragraph, and it does not really identify the presently claimed invention. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claims 98 and 117 are objected to because the term "collateralisation" should be spelled "collateralization". Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 62-143 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims lack any specific technology such as a computer. The Board of Patent Appeals and Interferences found in *Ex pane Bowman*, 61 USPQ2d 1669, 1671 (2001)(Unpublished) that without including technology in the claims, they are "nothing more than an abstract idea which is not tied to any technological art and is not a useful art as contemplated by the Constitution."

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 80-98, 110-113, and 124-128 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 80 is indefinite because it is unclear whether "a party" in line 4 is one of the "at least one party" of line 2 or a different party entirely. Clarification is required.

Claim 89 is indefinite because it is not clear whether "an account" of lines 1 and 2 are the same account as listed in the preamble of claim 80 (line 3) or a different account.

Claim 92 is indefinite because it is unclear whether "a party" on line 1 is the same as "a party" on line 4 of claim 80.

Claim 99 is indefinite because it is not clear whether the reference to "a party" in line 4 is a party of the previously identified "at least one party" on line 2 or a completely different party.

Claim 110 is indefinite because it is unclear whether "an account" of lines 1 and 2 are the same account as listed in the preamble of claim 99 (line 2) or a different account.

Claim 113 is indefinite because unclear whether "a party" on line 1 is the same as "a party" on line 4 of claim 99 or "at least on patty" on line 2.

Claim 118 is indefinite because it is not clear whether the reference to "a party" in line 4 is a party of the previously identified "at least one party" on line 2 or a completely different party.

Claim 124 is indefinite because it is not clear whether the reference to "a buyer" and "a seller" in line 5 are the same buyer and seller of line 1 or different. If they arc the same, they should be preceded by the term "said" or "the."

Claims 81-98, 111-112 and 125-128 are indefinite because they depend from rejected base claims 80, 110, and 124.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible . harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*. 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 62, 80, 99, 118, 119, and 124 are rejected under the judicially created doctrine of double patenting over claim 33 of U. S. Patent No. 5,970,479 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: A method of exchanging obligations comprising the steps of (a) maintaining a shadow credit record and a shadow debit record, (b) adjusting each respective party's shadow credit record or shadow debit record, allowing only those transactions that do not result the value of the shadow debit record being less than the value of the shadow credit record at any time, and (c) the supervisory institution instructing ones of the exchange institutions to exchange credit or debits to the credit record or debit record in accordance with the adjustments of the permitted - transactions .

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). *See also* MPEP § 804.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Musmanno et al patent is directed to a securities brokerage-cash management system, The Valentino patent is for a communication system that allows users access to up-to-date information regarding their financial information. The Dernbo patent is directed to a method and apparatus for optimally allocating resources. The Cuervo patent is for a method and apparatus that provide verifiable line of credit information- The Nagata et al. patent is for a credit transaction processing. system. The Shavit et al. patent is for an interactive market management system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sandra Snapp whose telephone number is

703-305-6940. The examiner can normally be reached on Mon.-Thurs..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vincent Millin can be reached on 703-308-1065. The fax phone number for the organization where this application or proceeding is assigned is (703) 872;9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

/s/ Richard Weisberger

Primary Examiner

Notice of Reference Cited

[FORM]

Application No. 09/567,507	Applicant(s)/ Patent Under Reexamination SHEPHERD, IAN KENNETH	
Examiner Sandra Snapp	Art Unit 3624	Page 1 of 1

U.S. PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date mm-yyyy	Name	Classification
A	US-4,774,663	09-1988	Musmanno et al.	705/36
B	US-4,648,037	03-1987	Valentino, James A.	705/36
C	US-5,148,365	09-1992	Dembo, Ron S.	705/36
D	US-5,025,138	06-1991	Cuervo, Vincent	705/38
E	US-RE32,985	07-1989	Nagata et al.	705/41
F	US-4,799,156	01-1989	Shavit et al.	705/26
G	US-5,970,479	10-1999	Shepherd, Ian K.	705/37
H	US-			
I	US-			
J	US-			
K	US-			
L	US-			
M	US-			

FOREIGN PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date mm-yyyy	Country	Name	Classification
N					
O					
P					
Q					
R					
S					
T					

NON-PATENT DOCUMENTS

	Include as application: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages
U	
V	
W	
X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).) Dates MM-YYYY format publication dates. Classifications may be US or foreign.

EXHIBIT 6

[LOGO]

Sterne Kessler

Goldstien Fox

Attorneys At Law

October 31, 2003

Writer's Direct Number:
(702)772-8677

Internet Address:
Rsokohl@skgf.com

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Re: U.S. Utility Patent Application
Appl No. 09/567,507; Filed: May 9, 2000
For: Methods of Exchanging an Obligation
Inventor: Ian Kenneth Shepherd
Our Ref: 1033.0170002

Sir:

Transmitted herewith for appropriate action are the following documents:

1. SKGF Cover letter;
2. PTO Fee Transmittal (Form PTO/SB/17);
3. Amendment and Reply Under 37 C.F.R. § 1.111;
4. Terminal Disclaimer To Obviate A Double Patenting Rejection Over A Prior Patent;
5. Third Request for Corrected Official Filing Receipt;

6. Copy of the Corrected Official Filing Receipt with corrections noted in red;
7. Copy of U.S. Patent No. 6,134,536;
8. Copy of Certificate of Correction granted March 11, 2003, for U.S.. Patent No. 6,134,536;
9. Copy of Certificate of Correction granted November 6, 2001, for U.S.. Patent No. 6,134,536;
10. Form PTO-2038 Credit Card Payment Form for payment of excess claim fees of $236.00; and
11. One (1) PTO Receipt Card.

It is respectfully requested that the attached postcard be stamped with the date of filing of these documents, and that it be returned to our courier. In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN
& FOX P.L.L.C.

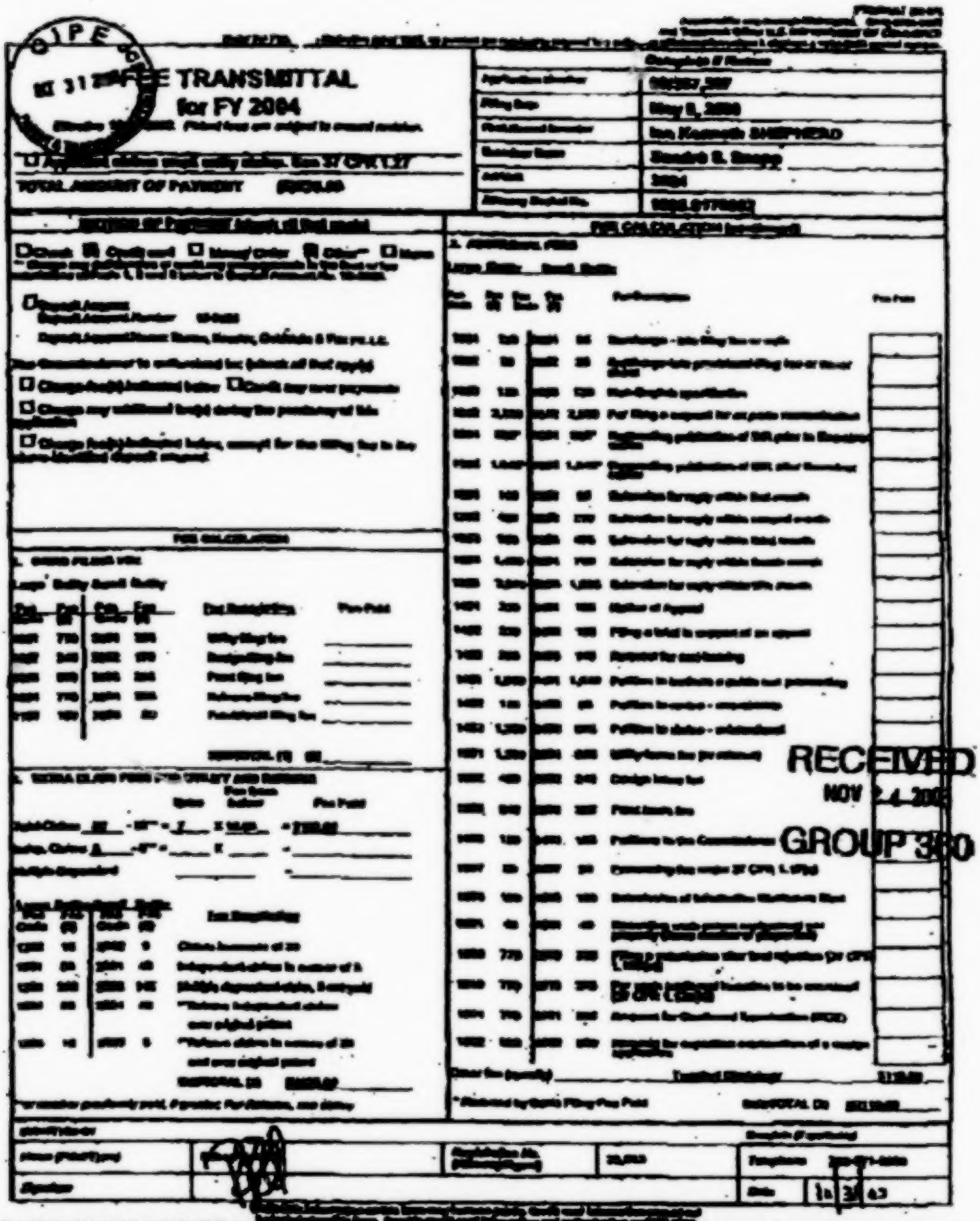
/s/ Robert Sokohl

Robert Sokohl

Attorney for Applicants

Registration No. 36,013

Enclosures



OIPE

OCT 31 2003

FEE TRANSMITTAL

for FY 2004

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT [illegible]

Application Number	[illegible]
Filing Date	May 8, 2000
First Named Inventor	Ian Kenneth SHEPHERD
Examiner Name	[illegible]
Art Unit	[illegible]
Attorney Docket No.	[illegible]

FEE CALCULATION

Other fee (specify) [illegible]

Date 10 31 03

RECEIVED

NOV 2 4 2003

GROUP 3600

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ian Kenneth Shepherd
Appl. No.: 09/567,507
Filed: May 9, 2000
Confirmation No.: 6891
Art Unit: 3624
Examiner: Sandra S. Snapp
Atty. Docket: 1033.0170002
For: Methods Methods Of Exchanging An Obligation

Amendment And Reply Under 37 C.F.R. § 1.111

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the Office Action dated September 3, 2003, Applicant submits the following Amendment and Remarks. This Amendment is provided in the following format:

(A) Each section begins on a separate sheet;

(B) Starting on a separate sheet, amendments to the specification by presenting replacement paragraphs marked up to show changes made;

(C) Starting on a separate sheet, a complete listing of all of the claims:

– in ascending order;

– with status identifiers; and

- with markings in the currently amended claims;

(D)Starting on a separate sheet, the Remarks.

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 19-0036.

Amendment to the Abstract

Please replace the Abstract with the following:

A method of exchanging an obligation between parties where the exchange is administered by a supervisory institution that ensures real-time settling of obligations between parties by updating shadow records in real-time and instructing one or more exchange institutions to effect, from time to time, the exchange of obligations in accounts maintained external to the supervisory institution. Updates to the exchange institution accounts may reflect the net obligations of parties over a nominated period of time. The role of the supervisory institution is to ensure that obligations are only settled where parties have sufficient balance in their shadow records to complete the transaction. Obligations that can be exchanged include, but are not limited to shares in financial or physical assets, participation rights in wagers, national or synthetic currencies, exchange settlement account deposits, taxation account deposits, and deposits of financial instruments or precious metals.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application.

62. (Currently amended) A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution, and wherein at least one [party maintains a] credit record and [a] one debit record is maintained with an exchange institution, the method comprising:

(a) maintaining a shadow credit record and a shadow debit record for a party to be held independently by the supervisory institution from the exchange institution;

(b) for every transaction resulting in an exchange obligation, the supervisory institution electronically adjusting said shadow credit record or shadow debit record, allowing only those transactions that do not result in a value of said shadow debit record being less than a value of said shadow credit record; and

(c) at the end of a period of time, the supervisory institution instructing the exchange institution to exchange credits or debits in accordance with said adjustments of said allowed transactions.

63. (Previously presented) The Method of claim 62, wherein said exchange obligation arises out of a transaction linked to a share price.

64. (Previously presented) The method of claim 62, wherein said exchange obligation arises out of a transaction linked to a weather event.

65. (Previously presented) The method of claim 62, wherein said exchange obligation arises out of a transaction linked to a market event.

66. (Previously presented) The method of claim 62, wherein said exchange obligation involves the transfer of shares in financial or physical assets.

67. (Previously presented) The method of claim 62, wherein said exchange obligation involves a wager..

68. (Previously presented) The method of claim 62, wherein said exchange obligation involves the transfer of a commodity.

69. (Previously presented) The method of claim 62, wherein said exchange obligation arises out of a transaction involving money for goods, services, promises, credits or warrants.

70. (Previously presented) The method of claim 62, wherein said period of time is a part of a day.

71. (Previously presented) The method of claim 62, wherein each said adjustment takes place in chronological order.

72. (Currently Amended) The method of claim 62, wherein said step of instructing [instructions represent credits and debits] represents a credit and a debit netted throughout a period for each party in respect to transactions of that period of time.

73. (Previously presented) The method of claim 62, wherein the exchange institution is a credit card company.

74. (Previously presented) The method of claim 62, wherein the exchange institution is a debit card company.

75. (Previously presented) The method of claim 62, wherein the exchange institution is a bank.

76. (Previously presented) The method of claim 62, wherein the exchange institution is a central bank.

77. (Previously presented) The method of claim 62, wherein the exchange institution is a guarantor offering credit to one or more parties involved in said exchange obligation.

78. (Previously presented) The method of claim 62, wherein the exchange institution is a party offering credit to one or more other parties involved in said exchange obligation.

79. (Previously presented) The method of claim 62, wherein said exchange obligation arises out of a currency exchange transaction.

80. (Currently amended) A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution, and wherein tat least one party maintains] an account is maintained with an exchange institution, the method comprising:

(a) maintaining a shadow [account] record for [a] the party to be held independently by the supervisory institution from the exchange institution;

(b) for every transaction resulting in an exchange obligation, the supervisory institution electronically adjusting said shadow (account] record, allowing only those transactions that do not result in a value of said shadow [account] record being less than zero; and

(c) exchanging [account] transactions between the supervisory institution and the exchange institution at the end of a period of time in accordance with said adjustments made in step (b).

81. (Previously presented) The method-of-Claim 80, wherein the account pertains to shares in financial or physical assets.

82. (Previously presented) The method of claim 80, wherein the account pertains to participation rights in wagers.

81 (Previously presented) The method of claim 80, wherein the account pertains to goods.

84. (Previously presented) The method of claim 80, wherein the account pertains to services.

85. (Previously presented) The method of claim 80, wherein the account pertains to central bank exchange settlement account deposits.

86. (Previously presented) The method of claim 80, wherein the account pertains to financial instrument deposits.

87. (Previously presented) The method of claim 80, wherein the account pertains to credit extended to/from a party or to/from a guarantor of a party.

88. (Previously presented) The method of claim 80, wherein the account includes an overdraft or line-of-credit with an exchange-institution.

89. (Canceled)

90. (Currently amended) The method of claim [89] 144, wherein two or more exchange

institutions operate in different time zones.

91. (Currently amended) The method of claim [891 144, wherein two or more exchange institutions have different account processing-cycles.

92.. (Currently amended) The method of claim 80, wherein [a] the party holds one or more accounts with more than one exchange institution.

93. (Previously presented) The method of claim 80, wherein the supervisory institution and exchange institution are legally and/or geographically domiciled in different countries.

94. (Previously presented) The method of claim 80, wherein one party is a buyer and the other party is a seller.

95. (Currently Amended) The method of claim 80, wherein an adjustment [a credit or a debit] is an irrevocable obligation placed on the exchange institution.

96. (Currently Amended) The method of claim 80, wherein an adjustment [a credit or a debit) is a time invariant obligation placed on the exchange institution.

97. (Currently Amended) The method of claim 80, further comprising debiting/crediting said shadow [account] record based on said transaction.

98. (Currently amended) The method of claim 80, wherein said exchange obligation arises out of a [collateralisation] collateralization payment obligetion.

99. (Currently amended) A method of processing a requested transaction between parties by a supervisory institution, wherein [at least one] a party maintains an account with an exchange institution, comprising :

(a) maintaining a shadow [account] record for [a] the party to be held independently by the supervisory institution from the exchange institution;

(b) obtaining from the exchange institution a balance for said shadow [account] record; and

(c) electronically checking the value of said shadow [account] record to determine whether there should be an exchange obligation as a result of the requested transaction — between patties.

100. (Previously presented) The method of claim 99, wherein the transaction involves a weather event.

101. (Previously presented) The method of claim 99, wherein the transaction involves a market event.

102. (Previously presented) The method of claim 99, wherein the transaction involves a wager.

103. (Previously presented) The method of claim 99, wherein the transaction involves an exchange of money for goods, services, promises, credits or warrants.

104. (Previously presented) The method of claim 99, wherein the exchange institution is a credit card company.

105. (Previously presented) The method of claim 99, wherein the exchange institution is a debit card company.

106. (Previously presented) The method of claim 99, wherein the exchange institution is a bank.

107. (Previously presented) The method of claim 99, wherein the exchange institution is a central bank.

108. (Previously presented) The method of claim 99, wherein the exchange institution is a party offering

credit to one or more other parties involved in said exchange obligation.

109.(Previously presented) The method of claim 99, wherein said exchange obligation arises out of a currency exchange transaction.

110.(Canceled)

111.(Currently amended) The method of claim [110] 145 wherein two or more exchange institutions operate in different time zones.

112.(Currently Amended) The method of Claim [110] 145, wherein two or more exchange institutions have different account processing cycles.

113. (Currently amended) The method of claim 99, wherein [a] the party holds one or more accounts with more than one exchange institution.

114. (Previously presented) The method of claim 99, wherein the supervisory institution and exchange institution are Legally and/or geographically domiciled in different countries.

115.(Previously presented) The method of claim 99, wherein one party is a buyer and the other party is a seller.

116.(Currently amended) The method of claim 99, further comprising debiting/crediting said shadow [account] record based on the transaction.

117.(Currently amended) The method of claim 99, wherein the transaction arises out of a - [collateralisation] collateralization payment obligation.

118.(Currently amended) A method of recording a transaction, involving at least two parties, by a supervisory institution, wherein at least one party maintains an account with an exchange institution, comprising:

(a) maintaining a shadow [account] record for [a] the at least one party to be held independently by the supervisory institution from the exchange institution, wherein said shadow record is stored electronically,

(b) obtaining from the exchange institution a balance for said shadow [account] record; arid

(c) recording the transaction between the parties based on the current value of the shadow [account] record

119.(Currently amended) A method of exchanging a payment obligation of a currency exchange transaction between banks, wherein an exchange obligation is administered by a supervisory institution, and wherein at least one bank maintains a credit record and a debit record with a central bank, the method comprising:

(a) maintaining a shadow credit record and a shadow debit record for a bank to be held independently by the supervisory institution from the central bank;

(b) for every currency exchange transaction resulting in a payment obligation, the supervisory institution electronically adjusting said shadow credit record or shadow debit record, allowing only those currency exchange transactions' that [do not] result in a net positive shadow record balance [value of said shadow debit record being less than a value of said shadow credit record]; and

(c) periodically instructing the central bank to exchange credits or debits in accordance with said adjustments of said allowed currency exchange transactions.

120. (Previously presented) The method of Claim 119, wherein each said adjustment takes place in chronological order.

121. (canceled)

122. (Previously presented) The method of claim 119, wherein a credit or debit is an irrevocable obligation placed on the central bank.

123. (Previously presented) The method of claim 119, wherein a credit or debit is a time invariant obligation placed on the central bank.

124. (Currently amended) A method of exchanging a payment obligation between a buyer and a seller, wherein the exchange of the payment obligation is administered by a supervisory institution, and wherein the buyer and seller maintain an account with a bank, the method comprising:

(a) maintaining a shadow [account] record for [a] the buyer or [a] the seller to be held independently by the supervisory institution from the bank;

(b) for every transaction resulting in a payment obligation, the supervisory institution electronically adjusting said shadow [account] record, allowing only those payment transactions that do not result in a value of said shadow [account] record being less than zero; and

(c) exchanging account transaction between the supervisory institution and the bank at the end of a period of time in accordance with said adjustments made in step (b).

125. (Previously presented) The method of claim 62, further comprising the step of obtaining from said exchange institution a balance for said shadow credit record and said shadow debit record.

126. (Currently amended) The method of claim 80, further comprising the step of obtaining from said exchange institution a balance for said shadow [account] record.

127.(Previously presented) The method of claim 119, further comprising the step of obtaining from said central bank a balance for said shadow credit record and said shadow debit record.

128.(Currently amended) The method of claim 124, further comprising the step of Obtaining from said bank a balance for said shadow [account] record.

129.(Currently amended) A method of exchanging an obligation between parties, wherein an exchange obligation is administered by a supervisory institution maintaining accounts for these parties, and wherein at least one [party maintains an] account is maintained with an exchange institution, the method comprising:

electronically debiting and crediting in real-time relevant accounts held by the supervisory institution of the applicable parties for each exchange obligation; and

periodically effecting, for each exchange obligation processed, a corresponding payment instruction to at least one exchange institution.

130.(Currently Amended) The method of claim 129, [where] wherein said exchange obligation is only so processed if the debit to said relevant account held by the supervisory institution does not result in a negative account balance.

131.(Currently Amended) The method of claim 129, [where] wherein said payment instruction to said exchange institution represents a transaction [credits] credit and a [debits] debit netted throughout a period of time.

132.(Currently Amended) The method of claim 129, [where] wherein said exchange institution is a central bank.

133.(Currently Amended) A method of exchanging an obligation between parties, wherein the exchange obligation is administered by a supervisory institution, the method performed by the supervisory institution, comprising:

maintaining a first account for a first party, independent from a second account

maintained by a first exchange institution;

maintaining a third account for a second party, independent front a fourth account maintained by a second exchange institution;

electronically adjusting said first account and said third account in order to effect the exchange obligation between said first party and said second party after ensuring that said first party and said second party have adequate value in said first account and said third account, respectively; and

providing an institutions to said first exchange institution and said second exchange [institutions] institution-to adjust said second aecount and said fourth account in accordance with the adjustment of said first account and said third account.

134.(Previously presented) The method of claim 133, Wherein the exchange institution is a central bank.

135.(Previously presented) The method of claim 134, wherein the instructions to adjust said second account and said fourth account are irrevocable obligations placed on said central bank.

136.(Previously presented) The method of claim 135, wherein the first exchange institution and the second exchange institution are the same.

137.(Previously presented) The method of claim 133, wherein said second account and said fourth account are the same account.

138.(Previously presented) The method of claim 133, wherein the exchange obligation involves currency.

139.(Previously presented) The method of claim 133, wherein the exchange institution is a non-bank clearing house or depository.

140.(Previously presented) The method of claim 133, wherein adequate value requires that said first account and said third account have a positive balance.

141.(Currently Amended) The method of claim 62, [where] wherein the exchange institution is a non-bank clearing house or depository.

142. (Currently Amended) The method of claim 99, [where] wherein the exchange institution is a non-bank clearing house or depository.

143. (Currently Amended) The method of claim 119, wherein the step of periodically instructing [happens] occurs at an end of a processing cycle.

144.(New) The method of claim 80, wherein a second party maintains an account with an exchange institution that is different from the exchange institution that maintains the account for the party.

145.(New) The method of claim 99, wherein a second party maintains an account with an exchange institution that is different from the exchange institution that maintains the account for the party.

146.(New) The method of claim 80 wherein exchanging transactions between the supervisory and the exchange institution at the end of a period of time represents netted adjustments made in step (b).

147.(New) The method of claim 80, wherein said period of time is a part of a day.

148.(New) The method of claim 80, wherein said exchange obligation arises out of a currency exchange transaction.

149.(New) The method of claim 118, further comprising debiting/crediting said shadow record based on the transaction.

150.(New) The method of claim 124, wherein said period of time is a part of a day.

151: (New) The method of claim 133, wherein said instruction to said first exchange institution and said second exchange institution represents adjustments to said first and said third account netted throughout a period of time.

152 (New) The method of claim 80, wherein the exchange institution is a bank. .

153. (New) The method of claim 80, wherein the exchange institution is a central bank.

Remarks

Claims 62-143 are pending in this application. Claims 62, 72, 80, 90-92, 95-99, 111¬113, 116419, 124, 126, 128-133, and 141-143 have been amended. Claims 89, 110 and 121 have been canceled without prejudice or disclaimer. Claims 144-153 have been added. These changes do not introduce any new matter or raise any new issues requiring further search by the Examiner. Entry of these amendments is therefore respectfully requested. Applicant has amended some of the claims (as discussed below) to accommodate the Examiner's rejections under 35 U.S.C. §§ 101 and 112. The remaining amendments have been made to more particularly point out Applicant's invention, and were not made to narrow the scope of protection nor overcome any prior art. Accordingly, based on the above amendments and the following remarks, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections, and that all the pending claims be passed to allowance.

I. *The Interview*

Applicant's representative thanks the Examiner for conducting an interview on October 7, 2003.

II. *Priority*

The Examiner has stated that Applicant has not filed a certified copy of the Australian application as required by 35 U.S.C. § 119(b).- -Applicant claims priority to Application No. 08/070,136 ("the '136 application"), which is now U.S. Patent No. 5,970,479, and Application No. 08/870,691 ("the '691 application"), which is now U.S. Patent No. 6,134,536. A certified copy of the Australian applications PL2677 (5/29/1992), P13216 (6/30/1992), PM9922 (7/12/1994) and PN4060 (7/7/1995) were filed in the '136 application and/or the '691 application. Applicant is not required to re-submit certified copies in all subsequent continuation applications.' See MPEP § 201.14(b). Accordingly, Applicant respectfully requests that the Examiner acknowledge that priority has been properly claimed in the next communication.

III. *Amendment to the Abstract*

The Examiner has objected to the Abstract. - Applicant has amended the abstract to accommodate the Examiner's objection. Applicant respectfully requests that the objection be withdrawn.

IV. *Rejection Under 35 U.S.0 § 112, second paragraph*

The Examiner has rejected claims 80-98, 110-113, and 124-128 under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has amended claims 80, 92, 99, 113, 118 and 124, canceled claims 89 and 110, and added claims 144 and 145 to accommodate the Examiner's rejection. The amendments to the claims are not intended to narrow the scope of protection, but rather to address the Examiner's indefiniteness rejection. Applicant respectfully requests that the rejection be withdrawn.

V. *Rejection under 35 U.S.G § 101*

The Examiner has rejected claims 62-143 under 35 U.S.C. § 101 because the claimed invention is allegedly directed to non-statutory subject matter. Applicant respectfully traverses since the Examiner's position is inconsistent with the statute and jurisprudence of the Supreme Court and Federal Circuit.

The first step in. analyzing whether a claim is directed to statutory subject matter is the language of 35 U.S.C. § 101, which-states, in part, "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, .may obtain a patent therefor . . ." Further, the Supreme Court has construed § 101 broadly, noting that Congress intended statutory subject matter to "include anything under the sun that is made by man." *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980). Nevertheless, the Court has identified three categories of unpatentable subject matter, namely "laws of nature, natural phenomena, and abstract ideas." *See Diamond v. Diehr*, 450 U.S. 175 (1981).

Claims 62-143 of the above-captioned application are directed at a "process," which is one of the four classes of statutory subject matter. However, the Examiner has opined that the claims are directed to an abstract idea therefore fitting into a judicially established exception to Section 101. The Examiner agreed with Applicant's representative at the interview that the claim did not merely recite an abstract idea, but rather recited a "real world" purpose, i.e., an exchange of obligations between parties (e.g., an exchange of money between parties) using exchange institutions (e.g., banks).[1] However, the Examiner still Maintains that the claim dries not fall within the "technological'. arts.

---

[1] *Ex parte Bowman*, 611./SPQ.2d 1669, 1671 (USPTO Bd. of Patent Appeals and Interferences zoo)) was also discussed during the interview. The undersigned pointed out that this case is a non-published, non-precedential opinion of the Board of Appeals and Interferences and therefore should not form the basis of a rejection. Instead the Examiner should be guided by the Federal Circuit's decisions in *State Street and AT&T Corp. v. Excel Communications, Inc* 172 F3d 1352 (Fed. Cir. 1999).

As discussed at the interview, Applicant strongly disagrees with the Examiner that the claims do not recite statutory subject matter since the claimed invention does not fall within any of the established exceptions to statutory subject matter (i.e., laws of nature, natural phenomena, and abstract ideas). Nevertheless, Applicant has agreed in order to expedite prosecution to amend the claims to include the fact that certain steps are performed "electronically." The Examiner has indicated in a recent telephone conversion that this amendment would overcome the pending rejection. Accordingly, Applicant respectfully requests that the rejection under 35 U.S.C. § 101 be withdrawn and that claims 62-143 be passed to allowance.

VI. *Double Patenting Rejection*

The Examiner has rejected claims 62, 80, 99, 118, 119, and 124 under the judicially created doctrine of double patenting over claim 33 of U.S. Patent No. 5,970,479. Applicant has attached hereto a properly executed terminal disclaimer. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

IV. *Conclusion*

All of the Examiner's stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding objections and rejections. The Examiner is invited to call the undersigned at the telephone number indicated below if such a call would facilitate the prosecution of this application.

1300

Respectfully submitted,

STERNER, KESSLER, GOLDSTEIN
& FOX P.L.L.C.

/s/ Robert Sokohl

Robert Sokohl

Attorney for Applicant

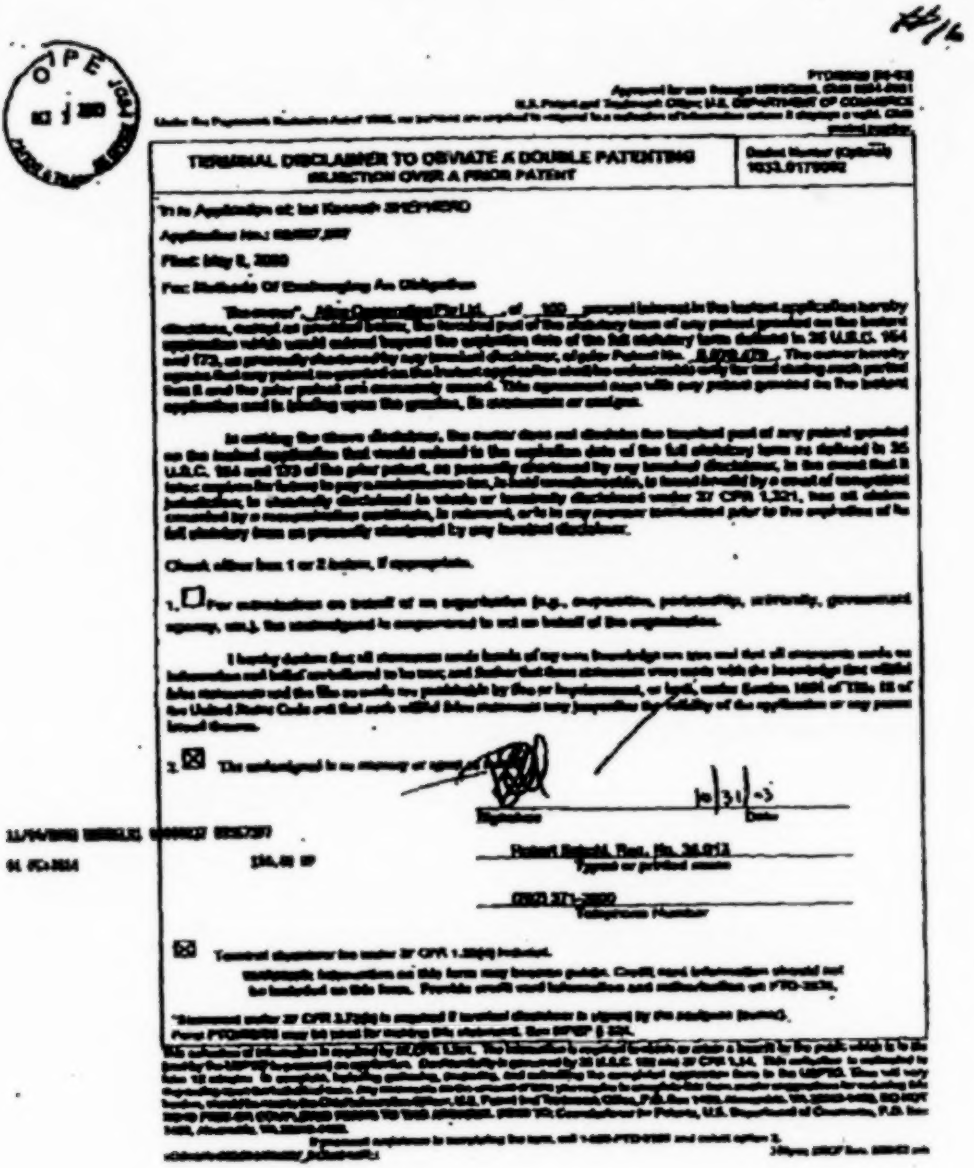
Registration No. 36,013

Date: 10/31/03

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

1301

EXHIBIT 7



#16

OIPE

[illegible]

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT

Docket Number (Optional)
[illegible]

In re Application of: Ian Kenneth SHEPHERD

Application No.: [illegible]

Filed: May 8, 2000

For: Methods Of Exchanging An Obligation

[illegible]

[illegible]

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

[illegible]

2. ☒ The undersigned is an attorney or agent of record.

10/31/03

Signature / Date

[illegible]
Typed or printed name

(202) 371-2600
Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

[illegible]

[illegible]

EXHIBIT 8

[SEAL]

UNITED STATES PATENT AND TRADEMARK OFFICE

United States Department Of Commerce
United States Patent and Trademark Office
Address: Commissioner For Patents
P.O. Box 1450
Alexandria, Virginia 22312-1450

Application No.: 10/331,331
Filing Date: 12/31/2002
First Named Inventor: Ian Kenneth Shepherd
Attorney Docket No.: 1033.0170004
Confirmation No.: 5681

STERNE, KESSLER, GOLDSTEIN & FOX PLLC
1100 New York Avenue, N.W.
Washington, DC 20005

Examiner Havan, Thu Thao
Art Unit: 3624
Paper Number:

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 10/331,331	Applicant(s) SHEPHERD, IAN KENNETH
Examiner Thu Thao Havan	Art Unit 3624

–The MAILING DATE of this communication appears on the cover sheet with the correspondence address–

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS born the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 14 December 2005

2a)☐ This action is FINAL.

2b)☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*. 1935 CD. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 26-109 is/are pending in the application.

4a) Of the above claim(s)_____is/are withdrawn from consideration.

5) ☐ Claim(s)______is/are allowed.

6) ☒ Claim(s) 26-109 is/are rejected.

7) ☐ Claim(s) ______ is/are objected to.

8) ☐ Claim(s).______ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification Is objected to by the Examiner.

10)☒ The drawing(s) filed on 31 December 2002 is/are:
a) ☒ accepted or
b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a Claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received In Application No.___.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s) 12/14/05; 12/31/02.

4) ☐ Interview Summary (PTO-413) Paper No(s) Mail Date. _____

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

* * * *

Application/Control Number: 10/331,331
Art Unit: 3624

DETAILED ACTION

Detailed Action

Drawings

The Examiner accepts the drawings filed on December 31, 2002.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. *See In* re *Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi,* 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Omum,* 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel,* 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. *See* 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 26-109 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-75 of U.S. Patent No. 6,912,510. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 26-109 of pending application 10/331,331 are the same method for intended use as claims 1-75 of U.S. Patent No. 6,912,510. The additional limitation discloses by application 10/331,331 is "a data processing system and a data storage unit" while all the other limitations in claims 26-109 are the same as claims 1-75 of U.S. Patent No. 6,912,510.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu Theo Haven whose telephone number is (571) 272-8111. The examiner can normally be reached on Monday-Friday.

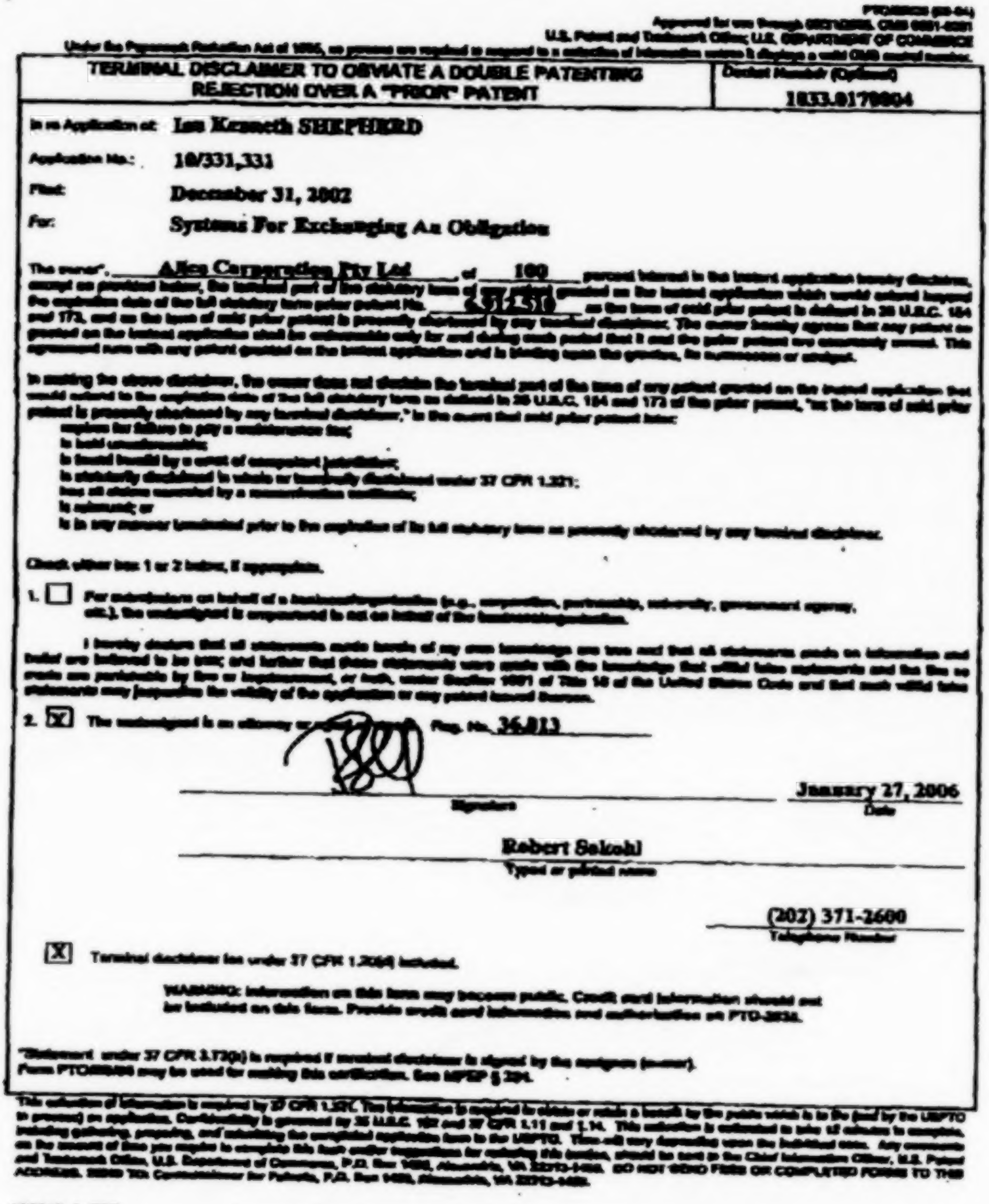
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vincent Millin can be reached on (571) 272-6747. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for unpublished applications is avagable through Private PAIR only. For more information about the PAIR system, *see* http://pair-direct-usoto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

TTH
12/23/2005

/s/ Vincent Pawn
Vincent Pawn
Supervisory Patent Examiner
Technology Center 3600

EXHIBIT 9



[illegible]

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

[illegible]

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional)
1833.0179004

In re Application of: **Ian Kenneth SHEPHERD**

Application No.: **10/331,331**

Filed: **December 31, 2002**

For: **Systems For Exchanging An Obligation**

The owner*, **Alice Corporation Pty Ltd**, of **100** percent interest in the instant application [illegible] prior patent No. **6,912,510** [illegible] 35 U.S.C. 154 and 173, [illegible]

[illegible] 35 U.S.C. 154 and 173 of the prior patent, [illegible]

[illegible] under 37 CFR 1.321;

[illegible]

Check either box 1 or 2 below, if appropriate.

1. ☐ [illegible]

[illegible]

2. ☒ The undersigned is an attorney [illegible] Reg. No. 36,813

Signature

January 27, 2006
Date

Robert Sokohl
Typed or printed name

(202) 371-2600
Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). [illegible]

[illegible]

[illegible] .DOC

[illegible]

EXHIBIT 10

Similar to PTO/SB/26 (09-06)

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER "PRIOR" PATENTS	Docket Number (Optional) 2151.0040005

In re Application of: Ian Kenneth SHEPHERD

Application No.: 11/166,387

Filed: June 27, 2005

For: Systems and Computer Program Products for Exchanging an Obligation *(As Amended)*

The owner*, Alice Corporation PTY Ltd., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent Nos. 6,912,510 and 7,149,720 as the term of said prior patents are defined in 35 U.S.C. 154 and 173, and as the terms of said prior patents are presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patents are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the prior patents, "as the term of said prior patents are presently shortened by any terminal disclaimer," in the event that said prior patents later:

expire for failure to pay a maintenance fee;
are held unenforceable;
are found invalid by a court of competent jurisdiction;
are statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
have all claims canceled by a reexamination certificate;
are reissued; or
are in any manner terminated prior to the expiration of their full statutory term as presently shortened by any terminal
disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 36,813.

Signature

9/11/08
Date

Robert Sokohl
Typed or printed name

(202) 772-8677
Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

IN THE UNITED STATES DISTRICT COURT FOR
THE DISTRICT OF COLUMBIA

Case No. 07-CV-00974-RMC

CLS BANK INTERNATIONAL,

Plaintiff,

v.

ALICE CORPORATION PTY. LTD.,

Defendant.

ALICE CORPORATION PTY. LTD.,

Counterclaim-Plaintiff,

v.

CLS BANK INTERNATIONAL,

Counterclaim-Defendant,

and

CLS SERVICES LTD.,

Counterclaim-Defendant.

DECLARATION OF STANLEY E. FISHER

STANLEY E. FISHER, under the penalty of perjury, hereby declares:

1. I am an attorney and a member of the firm of Williams & Connolly LLP, attorneys for Defendant and Counterclaim-Plaintiff Alice Corporation Pty. Ltd ("Alice"). I am familiar with the authenticity of the

documents attached and I submit this declaration in support of Alice's renewed cross-motion, under Fed. R. Civ. P. 56 and L. Civ. R. 7, for summary judgment that the claims of CLS' patents are invalid for lack of patent eligibility and in opposition to CLS's renewed motion for summary judgment. The Exhibits listed below are cited in the Memorandum in Support of Alice's Renewed Cross-Motion for Summary Judgment as to Patent Eligibility and in Opposition to CLS's Motion for Summary Judgment, or in Alice's Response to CLS's Statement of Material Facts as to Which There Is No Genuine Issue, and Counterstatement of Material Facts as to Subject Matter Eligibility, both dated September 22, 2010.

2. Attached as Exhibits 1 through 8 to this declaration are true copies of the following documents:

Exhibit 1	Declaration of Paul Ginsberg, dated September 22, 2010
Exhibit 2	U.S. Patent App. No. 2008/0154771, published June 26, 2008
Exhibit 3	Claims, dated March 29, 2010, from the prosecution history for U.S. Patent App. No. 11/642,437
Exhibit 4	Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101, dated August 24, 2009
Exhibit 5	Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of *Bilski v. Kappos*, published in Federal Register, volume 75, number 143, page 43,922, dated July 27, 2010

Exhibit 6	Transcript of Status Conference before Judge Collyer, dated August 6, 2010
Exhibit 7	Notice of Allowance and Fees Due, dated October 5, 2004
Exhibit 8	US Patent and Trademark Office Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101 Training Materials, dated August 25, 2009

Dated: Washington, DC
September 22, 2010

/s/ Stanley E. Fisher
Stanley E. Fisher

EXHIBIT 1

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Case No. 07-CV-00974-RMC

CLS BANK INTERNATIONAL,
Plaintiff,
v.
ALICE CORPORATION PTY. LTD.,
Defendant.

ALICE CORPORATION PTY. LTD.,
Counterclaim-Plaintiff,
v.
CLS BANK INTERNATIONAL,
Counterclaim-Defendant,
and
CLS SERVICES LTD.,
Counterclaim-Defendant.

DECLARATION OF PAUL GINSBERG

I. Background

1. My name is Paul Ginsberg. I am an independent business process consultant serving the financial services sector. I have attached my CV as Exhibit 1.

2. I have personal knowledge of the matters referenced herein.

3. I received a Bachelors of Science in electrical engineering from Pennsylvania State University in 1969. I received a Masters of Business Administration in finance and international business from George Washington University in 1976.

4. I have been in the field of banking systems and operations for over 30 years.

5. I am the Principal and Founder of Rational Initiatives Consulting LLC, established in 2003. Since 2005, as an independent consultant, I have advised system-product vendors for the financial market on improved product design; advised financial service providers on improving technical and business processes; and advised financial institutions on foreign exchange and derivative regulatory issues. To support my role as an independent consultant, I regularly review technical and operational articles and white papers from industry publications[1] and web sites,[2] technical vendor websites and position papers, as well as reports filed by market analysts and research firms.[3] I also attend webinars and industry

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[1] These include Bank Systems and Technology, Wall Street Technology, IFSA Magazine, FX Week, UBS Wealth Management, and SKF Evolution.

[2] These include the Wall Street Journal, the New York Times, the Financial Times, Euromoney, Bank Systems & Technology, WS&T Daily, TheTradeNews.com!, Finextra daily news, PC Magazine, Waters magazine, buysidetechnology.net, Global Custodian, Profit & Loss Squawkbox, InformationWeek, gtnews – the treasury and finance network, ICFA News, and Regulatory Compliance.

[3] These include Tower Group, Aite, and Gartner.

conferences[4] to further my understanding of change in the industry, technology and new products.

6. From 1976 to 1996, I worked for Citibank in a variety of systems and operations positions in such areas as funds transfer, payments, cash management, remittance services, and SWIFT product development.

7. In 1993, I joined the Quotron Division of Citibank. This division acted as a service provider for FXNET Ltd. and EBS, the Partnership, two separate consortiums of banks.

8. The FXNET Service, which was owned by the FXNET Ltd. consortium of banks, converted multiple foreign exchange contracts between two counterparties into a single obligation per currency, reflecting the net value of the original contracts, thus reducing (but not eliminating) the amount of principal exposed to settlement risk. I was initially the product manager for the FXNET Service, and eventually was named Managing Director with responsibility for the entire service, including systems development and Quality Assurance, sales and marketing, customer support and financial management.

9. The EBS Service, which was owned by EBS, the Partnership, is an electronic broking system for matching bids and offers for spot foreign exchange trades. While managing the FXNET Service for Quotron, I also held senior management responsibilities for the EBS Service. Initially I was part of the product design team that developed the EBS Service. I also worked with the implementation and sales teams to roll out the EBS Service. Later, I assumed responsibility for managing the EBS

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[4] These include SIFMA Ops and SIBOS.

relationship with IBM, who was contracted by EBS to rearchitect the EBS System. I was the primary interface with IBM project management for all technology deliverables as well as packaged software to be used.

10. In 1996/1997, EBS, the Partnership, acquired from Citibank the responsibilities and resources to manage the FXNET Service and the EBS Service. In 2002, EBS, the Partnership acquired FXNET Ltd. and I was named to the board of this wholly owned subsidiary.

11. I have participated in a number of committees and working groups addressing operational and technical issues related to foreign exchange trades, as set forth below.

12. From approximately 1997 to 2003, I served as the representative of EBS on the Operations Management Working Group of the Foreign Exchange Committee which is sponsored by Federal Reserve Bank of New York. As part of my role on this working group, I had personal involvement on subcommittees addressing a variety of operational issues, including defining best practices ("Management of Operational Risk in Foreign Exchange," published in 2004); adopting a solution for the processing of Non-Deliverable Forwards ("NDF") confirmations; and assessing the impact of the proposed CLS Service on banking operations.

13. I was also a charter member of the CLS North American User Group, which discussed CLS design and operational issues from the standpoint of the initial (and prospective) CLS Members who were located in North America, including in the United States. I remained on this user group until 2001, when

CLS decided to restrict membership on the CLS North American User Group to CLS Members.

14. I also served on the SIFMA (previously Securities Industry Association, or SIA) committee formed to examine shortening equity settlement times from 3 days to 1 day. This was known as the "T+1" (meaning trade day plus one day) project in the industry. Here, I advised on FX implications of settlements if the industry were to implement T+1 settlements for equities that require FX payments.

15. I have spoken at bankers' association conferences in the U.S., U.K., Singapore and Japan. I have also spoken about high-level systems processes at industry conferences and for internal training for various clients.

16. I have met with industry groups and regulators concerning FX trading and settlement in Asia (Hong Kong Monetary Authority, Monetary Authority of Singapore, Reserve Bank of Australia, Bank of Japan), the United States (the Federal Reserve and the NY Clearinghouse), and the United Kingdom (the Bank of England and Financial Services Authority).

II. Requested Opinions

17. I have been asked for my opinion concerning the scope of claims 33 and 34 of U.S. Patent No. 5,970,479 ("the '479 patent"), and all claims of U.S. Patent Nos. 6,912,510 ("the '510 patent"), 7,149,720 ("the '720 patent") and 7,725,375 ("the '375 patent"). For purposes of this Declaration, I will refer to these claims as the "Asserted Claims," and the four patents as the "Asserted Patents" or "Shepherd Patents."

18. In particular, I have been asked for my opinion as to scope of the Asserted Claims of the '720 and '375

patents, including, among other components, the nature of the "data processing system," "computer" and "data storage unit" recited in those claims. In addition, I have been asked for my opinion as to scope of the Asserted Claims of the '510 patent and claims 33 and 34 of the '479 patents, including whether any or all steps of methods recited therein must be implemented electronically using a computer system programmed to do so. With this in mind, I have reviewed all four Asserted Patents, as well as their prosecution histories.

19. I have also been asked to provide background testimony as to the settlement of obligations, such as the foreign currency exchanges that I understand to be at issue in this litigation.

III. Person of Ordinary Skill in the Art

20. In my opinion, the person of ordinary skill in the art to which the Asserted Patents are directed is a person with experience in banking operations and systems, including at least five years experience in the financial services industry with knowledge of and experience in large value trading, settlement, and payment computer systems and methods. This could, for example, be a person with a financial business background who has specified technology requirements for payment systems or other financial systems. Alternatively, it could be an individual experienced in financial computer systems who has worked with operations and business people to build systems to meet various banking needs.

IV. Background on the Exchange of Obligations

21. When obligations arise from a trade made between two parties, *e.g.*, a trade of stock or a trade of foreign currency, typically, there is a gap in time

between when the obligation arises and when the trade is "settled." In a number of financial contexts, the process of exchanging obligations, or settlement, is separate from the process of entering into a contract to perform a trade.

22. For example, if Bank of America wishes to exchange 10,000,000 U.S. dollars for euros, it might enter into a binding obligation (mediated through what are usually known as the foreign exchange markets) to sell those dollars to Deutsche Bank in exchange for 7,500,000 euros. Typically, it would not be obligated to give Deutsche Bank the dollars, nor would Deutsche Bank be obligated to give them the euros, until two days after the price is set and the agreement is confirmed. After two days, the parties will "settle" the trade—that is, Bank of America will pay its dollars to Deutsche Bank, and Deutsche Bank will pay its euros to Bank of America.

23. A simple way for Deutsche Bank and Bank of America to settle their trade would be for Deutsche Bank to wire Bank of America 7,500,000 euros, and for Bank of America to wire Deutsche Bank 10,000,000 dollars. However, this approach has a risk: if Bank of America wires the dollars, but Deutsche Bank fails to wire the euros, Bank of America will have lost its 10,000,000 dollars. If, for example, Deutsche Bank has gone bankrupt and/or is shut down by regulators, the loss may be permanent. The risk that only one side, or "leg," of a trade will be fulfilled during the process of settlement is known as "settlement" risk.

V. Background on the Patented Inventions

A. Eliminating Settlement Risk

24. The Asserted Claims of the Shepherd patents are all generally directed to methods or systems that

help lessen settlement risk using a computer system. Generally speaking, a trusted third party might operate a computer system that is configured in a particular way to exchange the parties' obligations, and by performing the particular electronic method using that computer system, can lessen settlement risk.

B. The Patents

25. The Asserted Patents share, with minor differences, a common specification. This specification discloses a complex computer-based system and various electronic methods for formulating risk management contracts, trading the contracts, and exchanging the resulting obligations. E.g., '510 patent, col. 3, ll. 39–48 ("The invention encompasses methods and apparatus enabling the management of risk relating to specified, yet unknown, future events by enabling entities (parties) to reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent on the occurrence of the specified future events. The entities submit such orders to a 'system' which seeks to price and match the most appropriate counter-party, whereupon matched contracts are appropriately processed through to their maturity."); see also '479 patent, col. 3, ll. 29–39 (same); '720 patent, col. 3, ll. 46–55 (same); '375 patent, col. 3, ll. 38-47(same). "The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices." '510 patent, col. 31, l. 66–col. 32, l. 3; '720 patent, col. 32, ll. 29–33 (same); '479 patent, col. 28, ll. 13–15 (same); '375 patent, col. 32, ll. 17–20 (same).

26. The systems and methods for exchanging an obligation reflect one aspect of this broader system. *See, e.g.*, '510 patent, col. 5, ll. 21–23 ("The invention also encompasses apparatus and method dealing with the handling of contracts at maturity, and specifically the transfer of entitlement."); '720 patent, col. 5, ll. 60–62 (same); '479 patent, col. 5, ll. 61–64 (same); '375 patent, col. 5, ll. 50–52; *see also* '510 patent, col. 36, ll. 33–46 ("CONTRACT APPS is a term used to refer to certain types of units of applications software. . . . The purpose of individual CONTRACT APPS is two-fold: *First*, to effect the trading/exchange/transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others. . . . And *second*, to appropriately manage all matched/confirmed contracts through to their time of maturity, *including their ultimate settlement*.") (emphasis added); '720 patent, col. 37, ll. 30–44 (same); '479 patent, col. 32, l. 61–col. 33, l. 7 (same); '375 patent, col. 37, ll. 24–37 (same).

27. The claims of the '510, '720, and '375 patents are primarily directed towards methods and systems, respectively, for this latter "exchanging an obligation" aspect of the invention as is apparent from the title of the '510 patent, "Methods of Exchanging an Obligation," the title of the '720 patent, "Systems for Exchanging an Obligation," and the title of the '375 patent, "Systems and Computer Program Products for Exchanging an Obligation." A person of ordinary skill in the art would understand, as I do, that claims 33 and 34 of the '479 patent are directed to "methods for exchanging an obligation" using a computer system. The claims of all of these patents are directed to computer methods, systems, and program products for

exchanging an obligation in specific computerized manner.

VI. '479 Patent and '510 Patent—Opinions Concerning Scope of the Claims

28. As noted, claims 33 and 34 of the '479 patent recite methods by which obligations are exchanged.

29. A person of ordinary skill in the art, reviewing the claims in view of the patent specification (including the description of the subject matter in ¶¶ 25–26 above) and the prosecution history, would understand that the method is to be performed on a computer and storage device configured to perform certain tasks. As the patent explains, the invention involves novel systems and methods in the field of data processing technology. '479 patent, col. 28, ll. 13–15 ("The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices."). The entire patent is directed to computer systems and the software applications, e.g., "CONTRACT APPS," needed to perform the methods described in the patent. '479 patent, col. 32, l. 61–col. 33, l. 7 ("CONTRACT APPS is a term used to refer to certain types of units of applications software. . . . The purpose of individual CONTRACT APPS is two-fold: First, to effect the trading/exchange/transfer of risk aversion transactions (and derivatives of these transactions) between participating ordering parties and counterparties on terms acceptable to the parties involved as well as to others. . . . And second, to appropriately manage all matched/confirmed contracts through to their time of maturity, including their ultimate settlement." (emphasis added); see also '479 patent, col. 42, ll. 8–12 ("In their manifestation as telecommunications/ computer software residing on

telecommunications/computer hardware, individual CONTRACT APPS consist of a cluster of processes, utilizing a number of data files, residing on one or more processing units."). Figure 2 of the specification depicts such a computer system and Figure 25 depicts a method step within the scope of the claims utilizing a computer system.

30. Furthermore, claim 12 of the '479 patent claims a system that is configured to, among other things, perform functions similar to those recited in claims 33 and 34. The claim, in its entirety reads: "The system as in claim 4, further comprising a credit record and a debit record for each stakeholder held with an exchange Institution, the credit records and debit records for exchange of entitlements; and *the data storage means of the data processing apparatus being configured to include a shadow credit record and a shadow debit record for each stakeholder, the data processing means being configured to obtain a start-of-day balance for each shadow credit record and shadow debit record, and for every transaction resulting in an exchange obligation, adjusting the respective shadow credit record or shadow debit record*, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order, and *the data processing means further being configured to, at the end-of-day, instruct ones of the exchange institutions* to exchange transacted credits or debits to the credit record and debit record of the respective stakeholders in accordance with the adjustments of the said permitted transactions, the credits and debits be irrevocable, time invariant obligations placed on the exchange institutions." (emphasis added).

31. Similarly, claim 28 of the '479 patent recites "the method as in claim 18, wherein each stakeholder holds a credit record and a debit record with an exchange institution, the credit record and debit record for exchange of entitlements, the method comprising the further steps, following step (d), of: (i) *creating a shadow credit record and a shadow debit record for each stakeholder to be held independently by the data processing apparatus* from the exchange institutions; (j) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record; (k) for every translation resulting in an exchange obligation, *the supervisory institution adjusting each respective shadow credit record or shadow debit record*, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and (l) at the end-of-day, *the data processing apparatus instructing ones of the exchange institutions to exchange transacted credits or debits to the credit record and debit record* of the respective stakeholders in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions." (emphasis added).

32. Specific terms in the claims 33 and 34, when read in light of the specification, as well as the other claims of the'479 patent, such as this claim 12 and claim 28, would be understood by the person of ordinary skill in the art to require that the methods recited in those claims are electronically implemented by a computer coupled to a data storage unit. These include, for example, "shadow credit record," "shadow debit record," and "transaction." While I am not

construing these claim terms for all purposes, a person of ordinary skill in the art would unquestionably understand the terms "shadow credit record" and "shadow debit record" to require the electronic storage of data files in a data storage unit. *E.g.*, '479 patent, col. 24, l. 65 – col. 25, l. 2 ("The process effects these payment/receipts in a two-stage process. First, by debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts."). "[D]ata file PAYACC SHADOW" is a reference to data files in a data storage unit. And this is simply an example. There are many other references throughout this specification from which the person of ordinary skill in the art would understand, as I do, that claims 33 and 34 of the '479 patent are limited to electronically implemented methods.

33. I understand from reviewing the prosecution history that led to the issuance of the '510 patent that the examiner, at one point, *see* CLS Ex. 4, Office Action, at 3 (Sep. 3, 2003), suggests that the claims then being prosecuted—years after the '479 patent issued—and given their broadest possible construction as I am told is required under PTO regulations, would not necessarily be limited to an electronic implementation of the methods described without an express recitation of the term "electronically" in the claim. However, a person of ordinary skill in the art reviewing the 100-plus page specification of the '479 patent—then and today—would have understood that the methods recited in claims 33 and 34 of the '479 patent would be limited to electronic implementation using a computing device for the reasons discussed herein. While there are variations of the embodiments described in the patents that may be encompassed by claims 33 and 34, a person of ordinary skill in the art,

reading the patent and prosecution history, would conclude that these claims only cover electronically implemented methods of exchanging obligations, using a computer system program to accomplish the claimed method.

34. The '510 patent also claims methods by which obligations are electronically exchanged in a particular way so as to eliminate settlement risk.

35. Using claim 68 as an example, the method has four steps: (1) "maintaining a first account" for one party, independent from a second account maintained by an exchange institution; (2) "maintaining a third account" for a second party, also independent from a fourth account maintained by an exchange institution; (3) "electronically adjusting" the first and third accounts "in order to effect the exchange obligation" between the parties; and (4) providing an instruction "being an irrevocable, time invariant obligation" to the exchange institutions in accordance with the adjustment.

36. "Electronically adjusting" an "account" (or, in some claims, a "record") is a key feature of the method. The adjustment of accounts begins the process of effecting the exchange of obligations that is the method's stated purpose. *E.g.*, '510 patent, col. 28, ll. 50–58 ("The process effects these payment/receipts in a two-stage process. First, by debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts."). It is not possible to "electronically adjust" an account without some sort of electronic device. *E.g.*, '510 patent, col. 31, l. 66–col. 32 ("The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices.").

37. The electronic adjustment of an account necessarily results in some kind of physical, electronic change in the medium in which the data to be adjusted are stored. For example, if (as would be typical, *see, e.g.*, '510 patent, col. 7, ll. 17–20) (discussing Sun Microsystems "mass storage units"), the account information is stored on a hard disk drive within a data storage unit, adjusting the account will result in the ferromagnetic material located at particular areas on the hard drive—corresponding to the binary bits of the data—being magnetized or demagnetized. This has the tangible result of adding or removing value, or claims to money, from the accounts.

38. Moreover, a person of ordinary skill in the art would appreciate that if the accounts are to be adjusted electronically, they will also be maintained electronically in the claimed data storage unit. As disclosed in the patent, the computer system would be capable of both maintaining accounts and adjusting them. And the last step of providing an instruction to an exchange institution would also be understood to by a person skilled in the art to require a computer. Thus, the entire method in claim 68 of the '510 patent is performed using an electronic computer.

39. Looking at the claims and their terms, a person of ordinary skill in the art would understand, for much the same reasons as in the '479 patent, that—regardless of the precise scope of the claims—the claims of the '510 patent, like claims 33 and 34 of the '479 patent, recite methods to be performed on a computer, as opposed to a method that can performed offline using a pencil and paper or in some other manner without a computer.

40. In an abstract sense, it is possible to perform the business methods of maintaining accounts,

adjusting accounts, and providing an instruction without a computer or other hardware. If someone had thought of this invention 100 years ago, they might have implemented it in a non-electronic manner using various pre-computing tools such as an abacus or handwritten ledgers.

41. However, when the plain language of the very specific methods claimed in the '510 patent (as well as the '479 patent) are construed in light of the specification of which they are a part and in view of the prosecution history and other knowledge inherent in one skilled in the art, a person of skill in the art would conclude that the claimed methods must be implemented electronically using some type of computing processor and memory, which enables these methods to be carried out. The difference between the methods of the '479 patent and '510 patent and an abstract business method is not just that the methods can be performed faster using a computer than an exchange of obligations could be performed off-line; rather, the particular methods claimed in these patents only work, as intended, when carried out using a computer.

42. As mentioned above, it is clear that "[t]he apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices." '510 patent, col. 31, l. 67–col. 32, l. 3; '479 patent, col. 28, ll. 13–16. Put simply, the processes described in the patents—including the settlement process—are electronically implemented by way of a processor and memory. *See, e.g.*, '510 patent, col. 45, ll. 46–67 ("In their manifestation as telecommunications/computer software residing on telecommunications/computer hardware, individual CONTRACT APPS consist of a

cluster of processes, utilizing a number of data files, residing on one or more processing units."); '479 patent, col. 42, ll. 8–36 (same).

43. When I define the term "process" as a "method or a series of acts or steps," I conclude that claims 33 and 34 of the '479 patent and all of the claims of the '510 patent are process claims. They expressly recite methods of performing a particular transaction electronically, which requires (explicitly or implicitly) the use of a computer system.

44. Claims 33 and 34 of the '479 patent and all of the claims of the '510 patent recite methods in which the level of complexity in adjusting, maintaining and controlling multiple accounts for multiple stakeholders, and exchanging multiple obligations requires specific and reliable computers, storage devices, and communications controllers. The claim requires the implementation of the process using a particular machine, *i.e.*, a computer configured and programmed to carry out the processes of the claims. By this unique configuration and programming, the computer has been transformed into a particular machine that is unique from other computers of the same model that have not been configured or programmed in this way. The use of the particular machine imposes a meaningful limit on the scope of the claim, which is more than a mere statement of concept; rather it is a particular solution to a real world problem in need of solving. The performance of the method is observable and verifiable; accounts or records are debited and credited, resulting in currency value being exchanged.

45. The computer is a significant part of claims 33 and 34 of the '479 patent and all of the claims of the '510 patent. The computer performs functions that are

essential to the claims. The control of credits and debits to the stakeholders' accounts taking place multiple times per day, the examination of transactions submitted by two counterparties for matching, the review of running balances of accounts to prevent overdraft conditions disallowed by the claims, and the performance of the settlement step concluding with irrevocable instructions to move monies using unique controls and cross checks, all of which are critical and sophisticated operations well beyond basic administration of bank accounts. The computer serves as an important part of enabling the method to be performed, as opposed to merely increasing the speed of which something can be done. The methods are dependent on the ability to capture, store, control, adjust, and manage multiple accounts and transactions impacting the values stored in those accounts. A person of skill in the art would conclude that the complexity, as well as the accuracy and reliability essential for these actions, require data processing on a computer.

VII. '720 Patent and '375 Patent—Opinions Concerning Scope of the Claims

46. The claims of the '720 patent and claims 1–38 and 42–47 of the '375 patent recite a "data processing system" comprising a "data storage unit" and a "computer." E.g., '720 patent, claim 68; '375 patent, claims 1, 14 & 26. The systems of the '375 patent additionally may require a "first party device", a "second party device", or a "communications controller."

47. These computer systems are machines—physical devices, or concrete things consisting of parts. Furthermore, a data storage unit and a computer coupled to the data storage unit, a communications

controller, a first party device, and/or second party device, all uniquely configured to enable the processes specified, are all manufactured devices produced by a number of manufacturers from raw and prepared materials.

48. The "data storage unit" is a specific component, such as a disk drive or file server, that can store data. An example of a "data storage unit" disclosed in the specification is a "mass storage unit[] . . . commercially available from Sun Microsystems," such as is disclosed at col. 7, ll. 53–55 of the '720 patent. The data storage unit "ha[s] stored therein" information about at least two "account[s]" or "record[s]." *See also* '375 patent, col. 7, ll. 43–44.

49. The "computer" is also a specific component, comprising one or more "data processors . . . such as the Sun 670 MP manufactured by Sun Microsystems." '720 patent, col. 7, ll. 36–37. The computer is "coupled to" the data storage unit and is configured, using software, to manipulate data that is "stored" on the data storage unit. Id. The computer is also "configured to" perform steps of a method that is similar to (though not identical with) the methods of the '479 and '510 patents. This method has the effect of exchanging an obligation while eliminating settlement risk. The term "computer" would be understood by the person of ordinary skill in the art to refer to either one or more processors in a single unit or multiple processors in a distributed computer system involving multiple units at one or more sites, such as the "computer system" depicted in Figure 2a and discussed at col. 7, ll. 31–49 of the '720 patent.

50. The steps that the computer of the '720 and '375 patents are configured to perform, like the steps of the

methods claimed in the '479 and '510 patents, are to be performed electronically.

51. "Computer" and "data storage unit" therefore clearly refer to specific computer system hardware that has been configured with software to perform a specific set of functions.

52. The steps that the claimed system is configured to perform are, of course, intended to be performed by the computer. The claims of the '720 and '375 patents are directed only to the computer configured to perform them. Moreover, the claim recites that they are to be performed "electronically," and the remaining claim terms also are phrased in a way that, read in light of the specification, limits their performance to a computer (for the same reasons as for the analogous terms in the '479 and '510 patents). However, at a general level, the basic settlement operations could be performed without the aid of a computer if they were not so claimed.

53. Certain claims of the '375 patent also require a "first party device" and/or a "second party device," *e.g.*, a "computer," which are, for example, communications hardware products used by the stakeholders to communicate data or instructions to or from the processing units and are also referred to as stakeholder input/output devices. These may be personal computers, mini- or mainframe computers fitted with modems all discussed at col. 7, ll. 50–67.

54. Other systems of the '375 patent require a "communications controller," which, for example, effects communications between the processing units and the various external hardware devices (first and second party devices) used by stakeholders to communicate data or instructions to or from the

processing units. These controllers perform communications coordination and security processing for the messages coming to and leaving the processing units. Communications controllers are manufactured by the major technology vendors. Col. 7, ll. 46– 54.

55. Claims 39 to 41 of the '375 patent require a "computer program product," which is the software that gives direction to each of the processors and storage devices. This "computer readable program code" is embodied in a computer readable storage medium, i.e. magnetic tapes or drives. The program code causes the computer to send a transaction from the first party, to maintain information about the shadow accounts, to electronically adjust accounts to effect an exchange obligation from a completed transaction, and to generate instructions to the central banks that they move funds in the primary accounts of the counterparties, i.e., claim 39 of the '375 patent. A computer program product is an article produced from raw or prepared materials.

56. To summarize, the claims of the '720 and '375 patents are directed to a data processing systems, having particular components that are configured to electronically exchange obligations in a particular way requiring the use of the computer and data storage unit. These claims, as a whole, are directed to the particular practical application of the idea that by facilitating a particular type of transaction, where there is an exchange of obligations between different counterparties, the risks of various kinds of losses can be reduced or eliminated. These particular applications are not abstract as they describe specific solutions to existing problems in the finance world and are accomplished with specific and practical computing devices and products.

57. The claimed subject matter, principally a "computer," "data storage unit," "controller", a" first party device, and/or second party device," are configured and programmed to perform a particular financial transaction, implementing a concept in a tangible way with tangible results—money is exchanged in the mitigation of counterparty risk. The results of this effort can be measured by the amounts of monies moving between entities' accounts, and the reduction in financial risks for those entities for which other actions and countermeasures are no longer needed, all very tangible results.

58. These computer system claims recite manmade tangible embodiments for transacting foreign exchange. It is the configuration of computer and data storage units made in factories by man. They are articles produced from prepared materials like silicon chips and disk drives. These are physically assembled in unique devices, marketed to assemblers of these components who create systems in specified configurations and physical containers delivered to end users globally. They have a real world use. The computer system programmed in the way recited is used by banks like CLS Bank to settle foreign currency exchange transactions between the biggest global banks and brokerage firms using their accounts at the Central Banks of the major countries globally.

59. CLS's characterization of Alice's claimed methods as patenting "the concept of a 2-sided escrow," CLS Br. at 25, is inaccurate, at the least, because it does not address all of the limitations of Alice's claimed methods. For example, as it relates to claim 68 of the '510 patent, CLS's characterization ignores the role of the "second account maintained at a first exchange institution" that is "independent"

from the "first account for a first party." It also ignores the role of the "fourth account maintained at a second exchange institution" that is "independent" from the "third account for a second party" recited in Alice's claims. Finally, CLS's characterization again ignores the requirement that a computer and data storage unit be used to carry out the method electronically.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 22, 2010

/s/ Paul Ginsberg

Paul Ginsberg

GINSBERG

EXHIBIT 1

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--- International Product Executive with business experience in financial services and capital markets processing solutions

--- Demonstrated leadership with accomplishments in strategic analysis, business launch, development, and problem resolution

--- Proven at managing businesses, identifying client and process breakthroughs and leading program and staff realignment

--- Specific industry experience in financial services, technology, and process improvement

PROFESSIONAL EXPERIENCE

RATIONAL INITIATIVES CONSULTING, LLC

Connecticut 2004 –Present

Principal And Founder

- Strategic planning; business and market development; offering OTC traded products–FX, Derivatives, Commodities
- Front and mid-office systems and process assessments, business alignment, transformation and reengineering

- Expert Witness – research, deposition and testimony – Banking and business process, strategic system planning

- Expertise: Project and product management, integration and implementation; marketing; staff resourcing, development and training; business and operational risk assessments

- Clients: Financial services and capital market banks and vendors for international business and operational issues

ELECTRONIC BROKING SERVICES (EBS/ICAP)

New York, NY 1993 - 2004

General Manager(COO), FXNET Ltd.

- Directed operations, IT, customer service, sales, marketing, and product development.

- Business head -P&L performance, business growth, service quality, market pre-eminence and new offerings.

- Director/on the Board - FXNET LTD; Member, EBS Senior Management Committee, Personnel Committee.

- Head of EBS strategic vendor management, business risk management and business continuity initiatives.

CITIGROUP - New York, NY

Vice President, Director, Business Development, Global Cash Management 1989 - 1993

- Directed relationship, implementation and consulting teams for Fortune 500 treasurers.

- Developed/executed annual market strategies and sales plans outperforming revenue and satisfaction goals.

- Recruited, trained, coached and monitored teams and individuals' performance.

- Specified product design, managed introduction and acceptance; maintained relationships of most senior clients.

Vice President, Business Head, Latin America, Global Payment Products 1984 - 1988

- Managed operations, sales, marketing and relationships for 12-country service business

- Focused on senior account relationships, team motivation and cost controls.

- Organized marketing efforts, client pricing incentives; processes for account acquisition, customer service.

Earlier: *Global Product Marketing VP, Division Financial Controller, Int'l Operations Head*

EDUCATION

MBA, International Business/ Finance
GEORGE WASHINGTON UNIVERSITY
Washington, DC

BS, Electronic Engineering
PENNSYLVANIA STATE UNIVERSITY
University Park, PA

PROFESSIONAL PROGRAMS

— OTC FX Trading; BPMG Process Management; ISDA Operational Risk Assessment; Cash Mgt Products (CCM);

— Kepner-Tregoe DMPS; Citicorp Managing People; Negotiating; Consultative Sales Management; AMA Marketing

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PATENTS, INDUSTRY COMMITTEES AND PUBLICATIONS

- Presentations, training and publications on business process, cash management, FX, risk, payments and settlements.
- Patents for FX and credit process management, Co-author
- Association of Financial Professionals, Certified Cash Manager (CCM)
- NY Federal Reserve/FX Committee/ Operations Managers' Working Group Member,
- SIFMA, T+1 subcommittee on foreign exchange; Member,
- ISDA (International Swaps and Derivatives Association); assoc member and representative
- CLS–NAUG Continuous Linked Settlement Service, North American User Group Founding member
- Trustee and Treasurer, $3mil charitable organization; City-wide head of umbrella PTA group for 18 urban schools

EXHIBIT 2

United States Patent Application Publication

Trickey et al.

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Pub. Date: Jun. 26, 2008

SYSTEM AND METHOD FOR PROCESSING AND SETTLING PAYMENT INSTRUCTIONS RELATING TO VARIOUS FINANCIAL INSTRUMENTS

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U.S. Cl. 705/44; 705/35

ABSTRACT

Systems and methods are provided for processing instructions relating respectively to different forms of financial instruments. In one example, a system comprises an interface configured to receive instructions relating to at least two different forms of financial instruments. The system also comprises a plurality of processors each configured to apply a respective set of pre-settlement rules to instructions relating to financial instruments of a respective form.

Patent Application Publication Jun. 26, 2008 Sheet 1 of 6 US 2008/0154771 A1

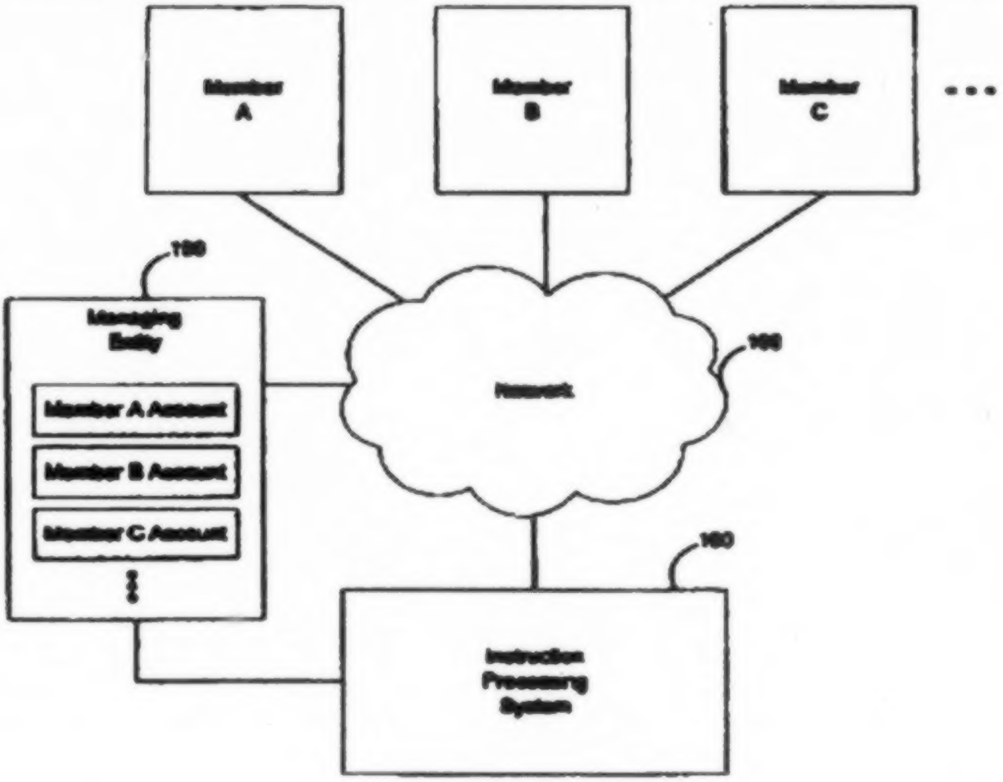

Member
A
Member
B
Member
C
Managing
Entity
Member A Account
Member B Account
Member C Account
Network
Instruction
Processing
System

Fig. 1

For Settlement

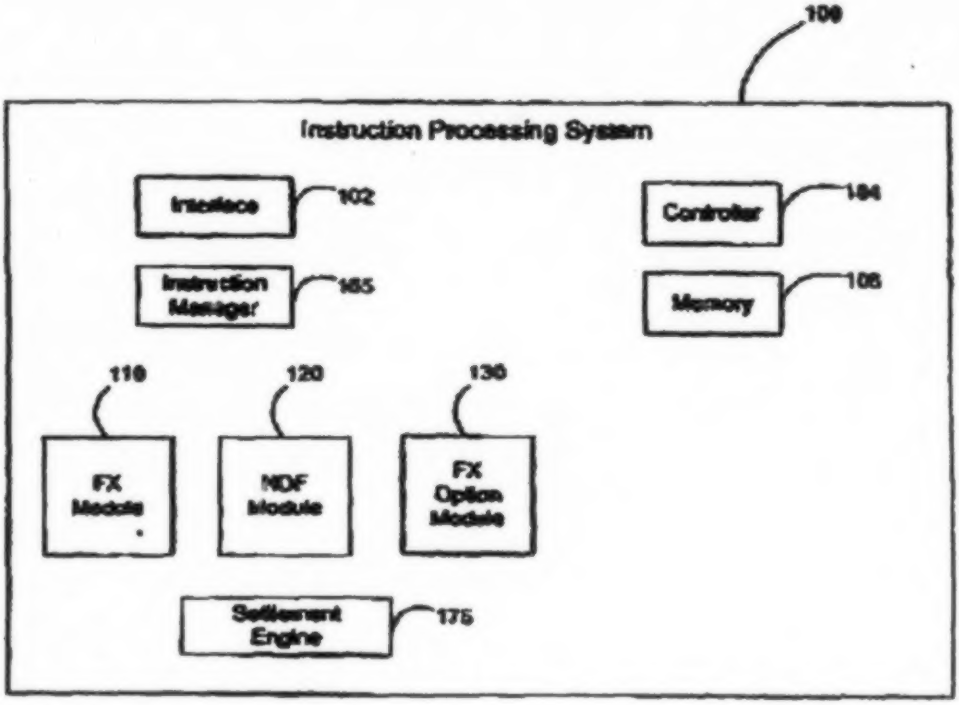

100
Instruction Processing System
Interface
102
Controller
104
Instruction Manager
165
Memory
106
110
120
130
FX Module
NDF Module
FX Option Module
Settlement Engine
175

Fig. 2

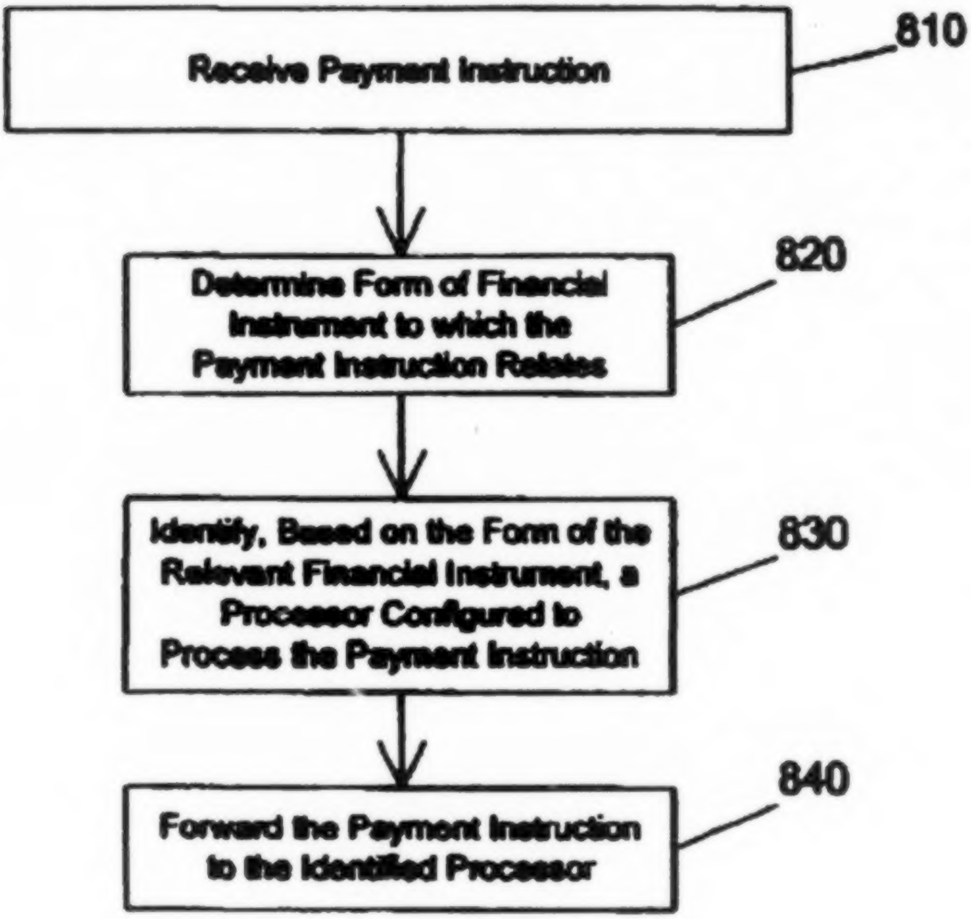

Receive Payment Instruction
810
Determine Form of Financial Instrument to which the Payment Instruction Relates
820
Identify, Based on the Form of the Relevant Financial Instrument, a Processor Configured to Process the Payment Instruction
830
Forward the Payment Instruction to the Identified Processor
840

Fig. 3

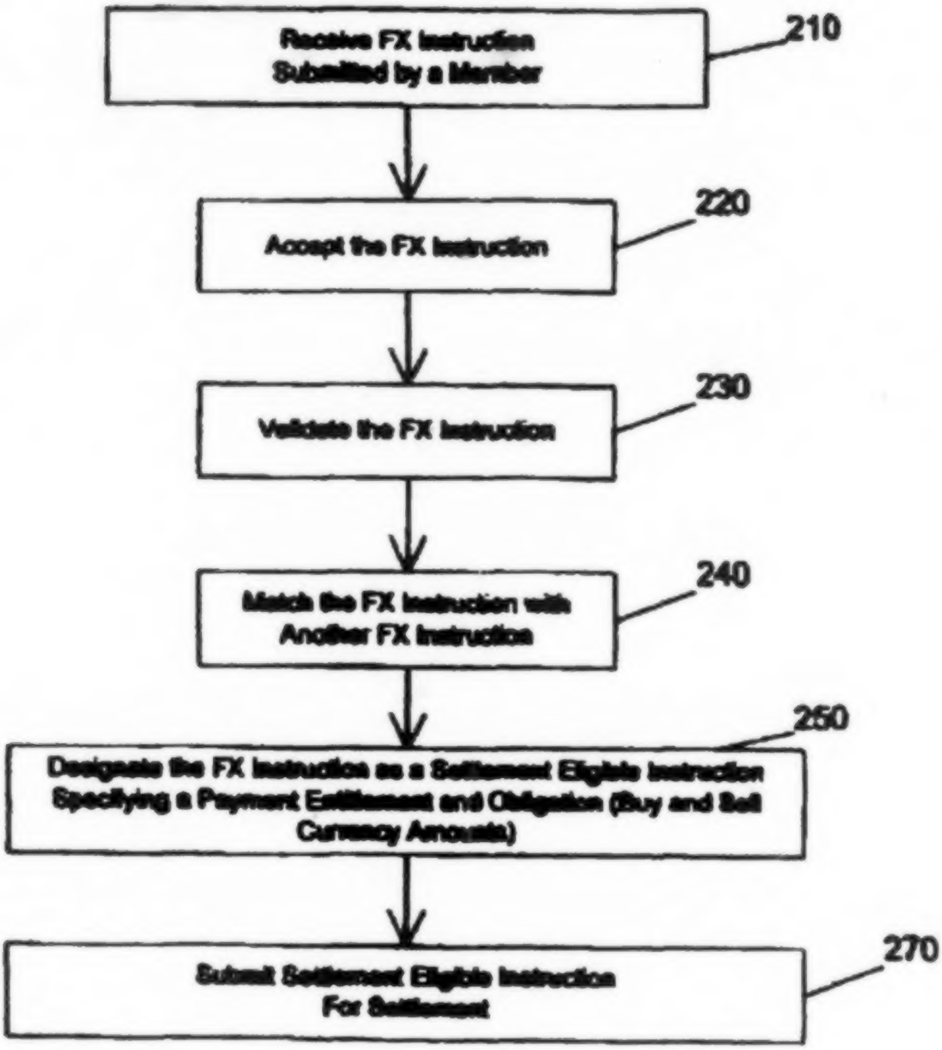

Receive FX Instruction Submitted by a Member
210
Accept the FX Instruction
220
Validate the FX Instruction
230
Match the FX Instruction with Another FX Instruction
240
Designate the FX Instruction as a Settlement Eligible Instruction Specifying a Payment Entitlement and Obligation (Buy and Sell Currency Amounts)
250
Submit Settlement Eligible Instruction For Settlement
270

Fig. 4

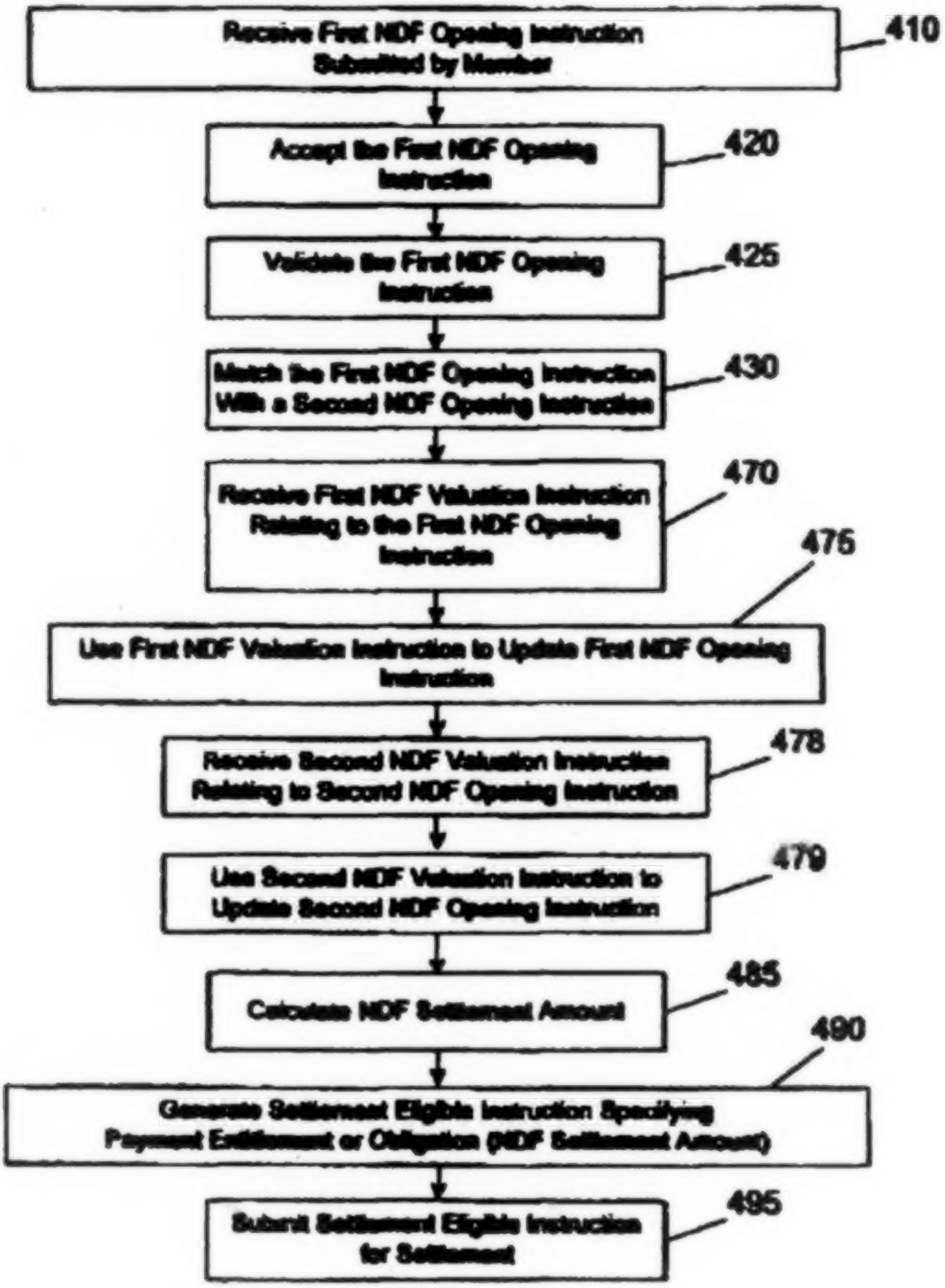

Receive First NDF Opening Instruction Submitted by Member
410
Accept the First NDF Opening Instruction
420
Validate the First NDF Opening Instruction
425
Match the First NDF Opening Instruction With a Second NDF Opening Instruction
430
Receive First NDF Valuation Instruction Relating to the First NDF Opening Instruction
470
Use First NDF Valuation Instruction to Update First NDF Opening Instruction
475
Receive Second NDF Valuation Instruction Relating to Second NDF Opening Instruction
478
Use Second NDF Valuation Instruction to Update Second NDF Opening Instruction
479
Calculate NDF Settlement Amount
485
Generate Settlement Eligible Instruction Specifying Payment Entitlement or Obligation (NDF Settlement Amount)
490
Submit Settlement Eligible Instruction for Settlement
495

Fig. 5

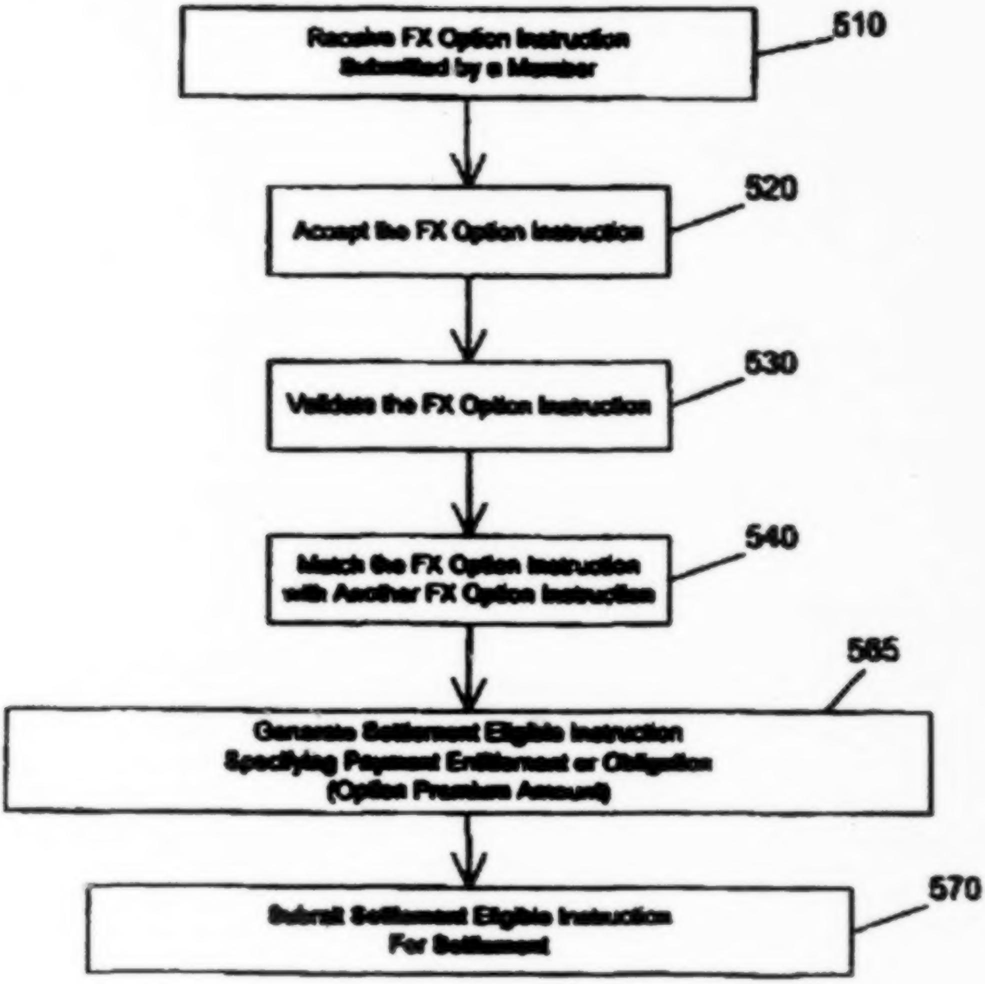

Receive FX Option Instruction
Submitted by a Member
510
Accept the FX Option Instruction
520
Validate the FX Option Instruction
530
Match the FX Option Instruction
with Another FX Option Instruction
540
Generate Settlement Eligible Instruction
Specifying Payment Entitlement or Obligation
(Option Premium Amount)
565
Submit Settlement Eligible Instruction
For Settlement
570

Fig. 6

SYSTEM AND METHOD FOR PROCESSING AND SETTLING PAYMENT INSTRUCTIONS RELATING TO VARIOUS FINANCIAL INSTRUMENTS

FIELD OF THE INVENTION

[0001] The invention relates generally to systems and methods for receiving and processing payment instructions relating to various financial instruments.

BACKGROUND OF THE INVENTION

[0002] Financial instruments have become a significant component of the global economy. In a typical transaction involving a financial instrument, two parties enter into an agreement to deliver, at an agreed upon date and time (or dates and times), either an amount of a specified currency, or a specified currency in an amount to be determined at a later time based on an agreed upon methodology. The form of the financial instrument varies depending on the nature of the economic terms of an underlying transaction. In most cases, the financial instrument, which comprises the terms of the two parties' agreement on the economic terms of the transaction, is confirmed and evidenced in writing. At an agreed upon date and time, the parties transmit payment instructions reflecting the terms of the financial instrument to a mutually agreed-upon financial institution, and the payment instructions are matched and settled. Settlement of payment instructions often involves the delivery of an amount of a specified currency (or amounts of specified currencies) arising from the transaction.

[0003] In many cases, current market practices for performing confirmation and/or settlement are dependent on a series of disparate methods and practices. The parties involved often perform confirmation and/or settlement using their own respective idiosyncratic methods. and often employ procedures for confirmation that are separate and distinct from the procedures used for settlement. In addition, the methods and processes used may differ depending on the form of the financial instrument involved.

[0004] Performing these procedures manually and without universally accepted procedures introduces a significant amount of inefficiency and risk into the financial markets. There is a need for improved methods and systems for facilitating the settlement of payment instructions related to financial transactions in the global foreign exchange markets.

SUMMARY OF THE INVENTION

[0005] In accordance with an example of an embodiment of the invention, an instruction processing system is used by an organization comprising a financial institution and a plurality of participants, or members, under which the financial institution provides a continuous linked settlement service to the participants. In this example, the organization comprises a managing entity, such as a bank, which operates and manages the instruction processing system. After a transaction involving a respective form of financial instrument has been entered into by members of the organization, payment instructions relating to settlement of payment entitlements and/or obligations arising from the transaction are submitted by the members to an instruction processing system. A payment instruction may also be submitted by a member after a transaction has been entered into by a customer of the member. The form of a financial instrument, and payment instructions relating thereto, vary as a function of the underlying transaction. The instruction processing system receives the payment instructions from the members, and processes the instructions to facilitate settlement of the respective payment entitlements and/or obligations.

[0006] The instruction processing system comprises multiple modules, each capable of processing payment instructions relating to financial instruments of a respective form, or type. In one example, the instruction processing system comprises a module configured to process payment instructions relating to foreign exchange transactions ("FX transactions"), a module configured to process payment instructions relating to non-deliverable forward transactions ("NDF transactions") and a module configured to process payment instructions relating to foreign exchange option transactions ("FX option transactions"). Each module applies a set of pre-settlement rules appropriate to the type of payment instructions it processes.

[0007] Accordingly, in one embodiment of the invention. a system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants is provided. The system comprises an interface configured to receive from participants a first instruction associated with a financial instrument of a first form and a second instruction associated with the financial instrument of the first form, and to receive from participants a first instruction associated with a financial instrument of a second form and a second instruction associated with the financial instrument of the second form. The system also comprises a first processor configured to establish an association between the first and second instructions associated with the financial instrument of the first form. and to apply a first set of pre-settlement rules to the first and second instructions associated with the financial instrument of the first form. The system additionally comprises a second processor configured to establish an association between the first and second instructions associated with the financial instrument of the second form, and to apply a second set of pre-settlement rules to the first and second instructions associated with the financial instrument of the second form.

[0008] The system may further comprise a third processor configured to direct the first and second instructions associated with the financial instrument of the first form to the first processor, and direct the first and second instructions associated with the financial instrument of the second form to the second processor. In one example, the financial, instrument of the first form comprises at least one transaction chosen from among the group consisting of: a foreign exchange transaction, an NDF transaction, and an FX option transaction. Similarly, the financial instrument of the second form comprises at least one transaction chosen from among the group consisting of: an FX transaction, an NDF transaction, and an FX option transaction.

[0009] The first processor may be further configured to accept and validate the first and second instructions associated with the financial instrument of the first form, and the second processor may be further configured to accept and validate the first and second instructions associated with the financial instrument of the second form. The first processor may also be configured to match the first instruction associated with the financial instrument of the first form with the second instruction associated with the financial instrument of the first form. Similarly, the second processor may be further configured to match the first instruction associated with the financial instrument of the second form with the second instruction associated with the financial instrument of the second form. In one example, the participants are members of a special purpose bank.

[0010] In another embodiment of the invention, a system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants is provided. The system comprises an interface configured to receive from participants a first instruction associated with an FX transaction and a second instruction associated with the FX transaction, and to receive from participants a first instruction associated with an NDF transaction and a second instruction associated with the NDF transaction. The system further comprises a first processor configured to establish an association between the first and second instructions associated with the FX transaction, and to apply a first set of pre-settlement rules to the first and second instructions associated with the FX transaction. The system also comprises a second processor configured to establish an association between the first and second instructions associated with the NDF transaction, and to apply a second set of pre-settlement rules to the first and second instructions associated with the NDF transaction.

[0011] In one example, the first set of pre-settlement rules requires automatically designating the first and second instructions associated with the FX transaction as settlement eligible after the association between the first and second instructions associated with the FX transaction is established.

[0012] In this example, the first instruction associated with the NDF transaction comprises a first non-deliverable forwards opening instruction ("NDF opening instruct-tion"), and the second instruction associated with the NDF transaction comprises a second NDF opening instruction. The second set of pre-settlement rules may require receiving a first valuation instruction comprising first additional information, receiving a second valuation instruction comprising second additional information, establishing a first association between the first valuation instruction and the first NDF opening instruction, and establishing a second association between the second valuation instruction and the second NDF opening instruction. The second set of pre-settlement rules may further require generating a settlement instruction based on inform-ation in the first valuation instruction, the first NDF opening instruction, the second valuation instruction, and the second NDF opening instruction, and submitting the settlement instruction for settlement. In these examples, instructions may be received in electronic form.

[0013] In another embodiment of the invention, a system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants is provided. The system comprises an interface configured to receive from participants a first instruction associated with an FX transaction and a second instruction associated with the FX transaction. The interface is also configured to receive from participants a first instruction associated with an FX option transaction and a second instruction associated with the FX option transaction. The system further comprises a first processor configured to establish an association between the first and second instructions associated with the FX transaction, and to apply a first set of pre-settlement rules to the first and second instructions associated with the FX transaction. The system also comprises a second processor configured to establish an association between the first and second instructions associated with the FX option transaction, and to apply a second set of pre-settlement rules to the first and second instructions associated with the FX option transaction.

[0014] In another embodiment of the invention, a system to process instructions relating to financial transactions is provided. The system comprises a first processor configured to apply a first set of pre-settlement rules to instructions relating to financial instruments of a first form, and a second processor configured to apply a second set of pre-settlement rules to instructions relating to financial instruments of a second form. The system further comprises a third processor configured to receive instructions relating to financial instruments of the first form and instructions relating to financial instruments of the second form. For each instruction, the third processor determines whether the instruction relates to a financial instrument of the first form or to a financial instrument of the second form, and forwards the instruction to the first processor, if the instruction relates to a financial instrument of the first form, or forwards the instruction to the second processor, if the instruction relates to a financial instrument of the second form.

[0015] In another example of an embodiment of the invention, a system to process instructions relating respectively to different forms of financial instruments is provided. The system comprises an interface configured to receive instructions relating to at least two different forms of financial instruments. The system also comprises a plurality of processors each configured to apply a respective set of pre-settlement rules to instructions relating to financial instruments of a respective form.

[0016] In another embodiment of the invention, a method to facilitate settlement of payments relating to transactions involving financial instruments among multiple participants is provided. The method comprises receiving, by a first processor, instructions relating to financial instruments of a first form and instructions relating to financial instruments of a second form. For each instruction, a determination is made, by the first processor, whether the instruction relates to a financial instrument of the first form or to a financial instrument of the second form. The method further comprises for-warding the instruction to a second processor configured to process instructions relating to financial instrument of the first form, if it is determined that the instruction relates to a financial instrument of the first form, and forwarding the instruction to a third processor configured to process instructions relating to financial instrument of the second form. if it is determined that the instruction relates to a financial instrument of the second form.

[0017] In accordance with another embodiment of the invention, a method for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants is provided. The method comprises receiving from participants a first instruction associated with a financial instrument of a first form and a second instruction associated with the financial instrument of the first form. The method also comprises receiving from participants a first instruction associated with a financial instrument of a second form and a second instruction associated with the financial instrument of the second form. An association is established, by a first processor, between the first and second instructions associated with the financial instrument of the first form, and a first set of pre-settlement rules is applied, by the first processor, to the first and second instructions associated with the financial instrument of the first form. An association is established, by a second processor, between the first and second instructions associated with the financial instrument of the second form, and a second set of pre-settlement rules is applied, by the second processor. to the first and second instructions associated with the financial instrument of the second form.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] These and other features and advantages of the invention will be apparent to those skilled in the art from the following detailed description of preferred embodiments, taken together with the accompanying drawings, in which:

[0019] FIG. 1 is a block diagram of an example of a system that may be used to process instructions relating to various financial instruments, in accordance with an embodiment of the invention;

[0020] FIG. 2 is a block diagram of an example components of an instruction processing system, in accordance with an embodiment of the invention;

[0021] FIG. 3 is a flowchart of an example of a method to identify a payment instruction and forward the payment instruction to an appropriate processor, in accordance with an embodiment of the invention;

[0022] FIG. 4 is a flowchart of an example of a method to process an FX instruction, in accordance with an embodiment of the invention;

[0023] FIG. 5 is a flowchart of an example of a method to process an NDF instruction, in accordance with an embodiment of the invention; and

[0024] FIG. 6 is a flowchart of an example of a method to process a FX option instruction, in accordance with an embodiment of the invention.

DETAILED DESCRIPTION

[0025] In accordance with an example of an embodiment of the invention, an instruction processing system is used by an organization comprising a financial institution and a plurality of participants, or members, under which the financial institution provides a continuous linked settlement service to the participants. In this example, a participant comprises a person or entity that maintains at least one account with the financial institution and submits payment instructions to the instruction processing system for processing and settlement.

[0026] In one example, the organization may comprise a managing entity, such as a bank, which operates and manages the instruction processing system. The managing entity comprises a plurality of members which maintain accounts therewith. After a trans-action involving a respective form of financial instrument has been entered into by members of the organization, payment instructions relating to settlement of payment entitlements and/or obligations arising from the transaction are submitted by the members to an instruction processing system. A payment instruction may also be submitted by a member after a transaction has been entered into by a customer of the member. The form of a financial instrument, and payment instructions relating thereto, vary as a function of the underlying transaction. The instruction processing system receives the payment instructions from the members, and processes the payment instructions to facilitate settlement of the respective payment entitlements and/or obligations.

[0027] The instruction processing system comprises multiple modules each capable of processing payment instructions relating to financial instruments of a respective form, or type. In one example, the instruction processing system comprises a module configured to process payment instructions relating to foreign exchange transactions ("FX transactions"), a module configured to process payment instructions relating to non-deliverable forward transactions ("NDF transactions") and a module configured to process payment instructions relating to foreign exchange option transactions ("FX option transactions"). Each module applies a set of pre-settlement rules appropriate to the type of payment instructions it processes.

[0028] Each member maintains at least one account with the managing entity. After a payment instruction is received and processed by the instruction processing system, payment entitlements and/or obligations arising from the settlement of the payment instruction are paid-in to, or paid-out from. as appropriate, the member's account with the managing entity, regardless of the form of the associated financial instrument. In one example, a member's payment entitlements and obligations are respectively paid-in to, and paid-out from, the same account.

[0029] FX transactions, NDF transactions and FX option transactions are well known and conducted regularly in global financial markets. An "FX transaction" may comprise a single deliverable foreign exchange spot or forward transaction, a single leg of a deliverable foreign exchange swap transaction, or any similar single deliverable foreign exchange transaction. Under the terms of an NDF transaction, two parties agree to "net cash settle" a forward FX transaction. The profit or loss is calculated by taking the difference between (i) the agreed upon exchange rate and (ii) the prevailing spot rate on the NDF valuation date, for an agreed upon notional amount of two currencies. On an agreed upon settlement date, one p arty with the "loss" makes a payment of the difference to the other party. Under the terms of an FX option transaction, two parties agree that one of the parties has the right, but not the obligation, to buy or sell one currency for another currency at a specified price (the "strike price"). The buyer of the FX option pays to the seller of the FX option a premium and. upon payment of the premium. the buyer has no further obligation with respect to the contract, but has the right to exchange the two currencies with the seller at the agreed strike price.

[0030] FIG. 1 is a schematic representation of an example of a system 50 for processing payment instructions relating to various types of financial transactions, in accordance with an embodiment of the invention. The system 50 comprises an instruction processing system 100, one or more members A, B, C, etc. a network 108. and a managing entity 190.

[0031] In the example of FIG. 1, the members A, B, C, etc., submit payment instructions to the instruction processing system 100 via the network 108. As mentioned above, the instruction processing system 100 is capable of handling payment instructions relating to a variety of different types of financial instruments including foreign exchange payment instructions ("FX instructions"), non-deliverable forward payment instructions ("NDF instructions"), and foreign exchange option payment instructions (FX option instructions"), for example. Accordingly, when a payment instruction to settle payment entitlements and/or obligations arising from a transaction is received from a member, the instruction processing system 100 identifies the form of the financial instrument the payment instruction relates to, and accepts, validates and attempts to match the payment instruction with another payment instruction relating to the same underlying transaction. For example, the instruction processing system 100 may receive a payment instruction relating to an FX option transaction entered into between two members. In response, the instruction processing system 100 identifies the payment instruction as an FX option instruction, and accepts, validates and attempts to match the payment instruction with another payment instruction relating to the same FX option transaction. The instruction processing system 100 also processes the payment instruction in a manner determined by its type. After a payment instruction is identified, matched with another payment instruction and processed appropriately, it may be designated as "settlement eligible." Alternatively, a new settlement eligible instruction may be generated based, at least in part, on the original payment instruction submitted by the member. Settlement eligible instructions are subsequently settled by the managing entity 190. It should be noted that in other examples, payment instructions submitted by non-member entities may also be received. processed and settled by the instruction processing system 100.

[0032] In one example, the contents and/or format of a payment instruction must satisfy criteria established by the managing entity 190 and/or the members. In another example, the contents and/or format of a payment instruction may conform to guidelines or requirements established by an interbank messaging system provider such as the Society for Worldwide Inter-bank Financial Telecommunications (S.W. I.F.T.). In yet another example, the contents and/or format of a payment instruction may be required to conform both to criteria established by the managing entity 190 and to guidelines or requirements established by an interbank messaging system provider. A payment instruction may comprise an identifier or code indicating the form of financial instrument to which the payment instruction relates (FX transaction, NDF transaction or FX option transaction, for example).

[0033] Additional information in a payment instruction is included as a function of the form of the financial instrument to which the payment instruction relates. For example, an FX instruction may be required to include (without limitation) information identifying: (i) the member submitting the FX instruction and the other member that is expected to submit a payment instruction with respect to the same transaction; (ii) the exchange rate and amounts and identities of currencies to be delivered and received pursuant to the FX instruction; (iii) the date on which the FX instruction is scheduled for settlement (the "settlement date"); (iv) identifiers/codes associated with the two counterparties to the underlying transaction, etc. It is to be understood that this list is exemplary only. In other examples, an FX instruction may be required to include information different from those items described in this paragraph.

[0034] An NDF instruction may be required to include (without limitation) information identifying: (i) the member submitting the NDF instruction and the other member that is expected to submit a payment instruction with respect to the same transaction; (ii) identifiers/codes associated with the two counterparties to the underlying transaction; (iii) the agreed-upon currency exchange (forward) rate used in the underlying NDF transaction; (iv) the notional amounts and identities of the two currencies used in the two notional foreign exchange transactions underlying the NDF transaction; (v) the agreed-upon valuation date; (vi) the settlement date, etc. It is to be understood that this list is exemplary only. In other examples, an NDF instruction may be required to include information different from those items described in this paragraph.

[0035] An FX option instruction may be required to include (without limitation) information identifying: (i) the member submitting the FX option instruction and the other member that is expected to submit a payment instruction with respect to the same transaction; (ii) identifiers/codes associated with the two counterparties to the underlying transaction; (iii) the amount and identity of the option premium currency to be paid or received; (iv) the option type; (v) the date and time at which the rights defined by the relevant FX option transaction expire; (vi) the settlement date, etc. It is to be understood that this list is exemplary only. In other examples, an FX option instruction may be required to include information different from those items described in this paragraph.

[0036] As mentioned above, when a payment instruction is received, the payment instruction processing system 100 accepts, validates and attempts to match the payment instruction. Acceptance of a payment instruction includes authentication of the payment instruction and an edit check. In one example, a payment instruction must satisfy authentication procedures established by the managing entity 190 and/or the members.

[0037] In the example of FIG. 1, a unique identifier may be allocated to each payment instruction after the payment instruction is accepted. In one example, the identifier may include the date on which the payment instruction was received by the instruction processing system 100, and a sequence number which is reset to zero at the start of each day. The identifier is subsequently used by components of the instruction processing system 100 to keep track of various payment instructions as they are processed.

[0038] To validate a payment instruction, the instruction processing system 100 may automatically check to ensure that the received payment instruction has not been processed already. The content of the payment instruction may also be examined to verify certain criteria, including, for example, that members referenced in the payment instruction are currently authorized to submit payment instructions, that currencies referenced in the payment instruction are currently eligible for processing and appropriate for the type of transaction, that the settlement currencies specified in the payment instruction are eligible for payment on the settlement date, that the payment instruction was submitted within applicable time constraints, etc. The payment instruction may also be also verified against one or more regulatory "filter" requirements" to determine the payment instruction's compliance with applicable laws. A regulatory filter may identify payment instructions that may be prohibited from settlement or require blocking or notifications to the relevant authorities due to economic sanctions legislation, regulations or executive order, for example.

[0039] Matching of a payment instruction is performed in accordance with a set of criteria, defined by the pre-settlement rules, that are specific to the payment instruction's type. Criteria specific to each payment instruction type allow information in a payment instruction to be matched with information in a corresponding payment instruction of the same type. For example, a payment instruction may be matched with another payment instruction of the same type by identifying (i) a match, in accordance with specified criteria, of a text field in the payment instruction with a corresponding text field, or different, text field in another payment instruction; (ii) a match, in accordance with specified criteria, of an amount in a specified field in the payment instruction with an amount in a corresponding, or different. field, in another payment instruction; (iii) a match of an amount specified in a field of the payment instruction with an amount within a specified tolerance in a corresponding, or different, field in another payment instruction; and/or (iv) a match, in accordance with specified criteria. of a date specified in a field of the payment instruction with a date in a corresponding, or different, field of another payment instruction. The specified criteria may require matching of two fields, such as two text fields, by an exact match of values in the two fields; alternatively, other criteria may be used to determine a match. Matching of a payment instruction may also be performed based on identifiers/code of the member submitting a payment instruction and the identifier/code of the transaction counterparty, as specified in a payment instruction. Matching may be performed based on other information in the payment instruction, as well.

[0040] In one example, the system 50 of FIG. 1 is supported by a software framework including a gateway server (not shown), enabling each member to submit payment instructions via a respective member site accessible via the network 108. In one example. the network 108 comprises a highly secure Internet Protocol-based interactive communication network. using either a store and forward message service or an IP packet service without guaranteed delivery, in which case acknowledgement is handled at the application level. An example of such a network is the SWIFT network, maintained by the Society for Worldwide Inter-bank Financial Telecommunications (S.W.I.F.T.). This global communications network for financial institutions is a proprietary value added network which provides both the FIN store-and-forward messaging service and the Interact IP packet service. The FIN service uses defined message format standards. The International Standards Organization (ISO) recognizes S.W.I.F.T. as the organization responsible for the promulgation and maintenance of these message standards within the global banking industry. Both the FIN and Interact services provide a high level of security. Participation is limited to specified users, which may include the managing entity 190 and the members A, B, C, for example.

[0041] In other examples. the network 108 may comprise one or more of a number of different types of networks, such as, for example, an intranet, a local area network (LAN), a wide area network (WAN), an internet, a Fibre Channel-based storage area network (SAN) or an Ethernet. The network 108 may also comprise a combination of different types of networks.

The Managing Entity

[0042] In one example, the managing entity 190 comprises a special purpose bank that provides a continuous linked settlement service for payment instructions relating to underlying transactions. The managing entity 190 uses central bank funds to settle payment instructions in real time. The managing entity 190 links to the Real Time Gross Settlement systems operated by central banks in selected nations throughout the world. In this example, the managing entity 190 is supervised by a government regulatory authority such as the U.S. Federal Reserve.

[0042] In this example, the managing entity 190 maintains and controls the instruction processing system 100. In the case of an underlying FX transaction, the managing entity 190 simultaneously settles the two payment instructions relating to the FX transaction. thereby eliminating the risk that one payment could be made and the corresponding payment not received. In the case of an underlying NDF transaction or FX option transaction, the managing entity 190 settles a single payment instruction relating to the underlying NDF transaction or FX option transaction.

[0043] In this example, customers of the managing entity 190 may join the managing entity 190 as a member. Accordingly, each of the members A, B, C, etc. may have at least one account with the managing entity 190, as shown in FIG. 1. Typically, a member maintains at least one multi-currency account with the managing entity 190, which enables the member to make "pay-ins" of funds and receive "pay-outs" of funds in various currencies through a single account. A member's payment entitlements and obligations arising from the settlement of payment instructions may be paid-in to, and paid-out from, the member's multi-currency account, for example. It should be noted that pay-ins and pay-outs may be completed through a member's account regardless of any timing issues arising from or otherwise relating to a particular financial instrument. The managing entity 190 typically settles a payment instruction designated as settlement eligible no earlier than its settlement date specified in the payment instruction. Payment instructions are settled when the managing entity 190 debits and credits the relevant members' accounts for the amounts involved. While these debits and credits occur throughout the settlement process, settlement members (i) fund pay-ins on a net basis by various specified times and (ii) receive pay-outs in accordance with a pay-out algorithm established by the managing entity 190. A "pay-in" comprises a payment made by a member to the managing entity 190, related to the settlement of one or more payment instructions involving the respective member, in accordance with rules established by the managing entity 190. A "payout" comprises a payment made by the managing entity 190 to a member, related to the settlement of one or more payment instructions involving the respective member, in accordance with rules established by the managing entity 190. As mentioned above, payment entitlements and/or obligations arising from the settlement of a payment instruction are paid-in to, or paid-out from, as appropriate, the member's account with the managing entity, regardless of the form of the associated financial instrument

[0045] It should be understood that the managing entity 190 may comprise institutions or organizations different from those described above. The managing entity may comprise one or more non-financial institutions, for example.

The Members

[0046] In one example, membership in the organization is offered to qualifying financial institutions. Applicants for membership must satisfy certain requirements established by the managing entity 190 and/or the members. Membership requirements may include, for example, a requirement that a member be a bank or other approved financial institution, requirements that members maintain capital equal to or in excess of stated capital and capital ratio requirements, etc. It should be understood that the requirements described here are exemplary only. In alternative examples, other requirements may apply to membership as determined by the managing entity 190 and/or the members.

[0047] In one example. the members A, B, C. etc., generate and transmit payment instructions to the instruction processing system 100 via the network 108. In this example, payment instructions are submitted in electronic form. For example, an employee of a respective member may use a computer (not shown), such as a personal computer (PC), connected to a server computer maintained by the member, to submit a payment instruction. The server computer may comprise, for example, a Hewlett-Packard Proliant DL 140 running the Windows 2000 Server operating system. With input from the employee, a payment instruction may be generated by an appropriate software application residing on the server computer. In one example, a payment instruction may be transmitted as an XML message delivered by a messaging system such as IBM WebSphere MQ. Payment instructions may be generated and submitted in other ways. as well. A payment instruction typically includes multiple items of information in accordance with a predetermined format.

Eligible Currencies

[0048] In the example of FIG. 1, the instruction processing system 100 only processes payment instructions relating to transactions involving selected currencies ("eligible currencies"). In this example, the managing entity 190 and/or the members determine which currencies are eligible for settlement.

Instruction Processing System

[0049] FIG. 2 is a block diagram of an example of components of the instruction processing system 100, in accordance with an embodiment of the invention. The instruction processing system 100 comprises a controller 104, an interface 102, a memory 106, an instruction manager 165, and a settlement engine 175.

[0050] The controller 104 orchestrates the activities of the various components of the instruction processing system 100. In one example, the controller 104 comprises a central processing unit ("CPU") controlled by software. Alternatively, or in addition, the controller 104 may comprise specialized circuitry.

[0051] The interface 102 provides a communication gate-way through which data may be exchanged between the controller 104 and the network 108. The interface 102 may comprise any one or more of a number of different mechanisms, including, without limitation. one or more SCSI cards, enterprise systems connection cards, fiber channel interfaces, modems, network interfaces, and/or a network hub.

[0052] The memory 106 is used by the controller 104, and by other components of the instruction processing system 100, to store data. In the example of FIG. 2, the memory 106 may comprise one or more disk drives, for example, and/or may comprise random-access memory (RAM). In alternative examples, the memory 106 may comprise any type of device capable of storing data files, including, without limitation, one or more magnetic tape drives, optical disks, etc.

[0053] The instruction processing system 100 also comprises a plurality of modules configured to process various respective types of payment instructions. In this example, the instruction processing system 100 comprises a foreign exchange instructions module ("FX module") 110, a non-deliverable forwards module ("NDF module") 120, and a foreign exchange option module ("FX option module") 130. Each module 110, 120, 130 comprises a processor configured to process payment instructions relating to a respective form of financial instrument. For example, the FX module 110 comprises a processor capable of processing FX instructions. Similarly, the NDF module 120 comprises a processor capable of processing NDF instructions, and the FX option module 130 comprises a processor capable of processing FX option instructions. In this example, each of the modules 110, 120, 130 comprises software and/or circuitry, and modules 110, 120, and 130 all reside and operate on a single computer system. In other examples, each of the modules 110, 120, 130 comprises software and/or circuitry and resides and operates on a separate, respective computer system. It should be noted that additional modules may be added to process other types of payment instructions.

[0054] It should also be understood that while in this example, the FX module 110, the NDF module 120 and the FX option module 130 are shown, in other examples the instruction processing system 100 may include any number of different types of modules. In addition, it should be understood that various functions performed by the modules 110, 120, 130, as well as the instruction manager 165 and the settlement engine 175, may be combined or distributed in other arrangements. For example, in another example, the functions of the NDF module 120 and the FX option module 130 may be combined into a single module. Also, the instruction processing system 100 may comprise multiple modules configured to process payment instructions relating to one type of transaction. For example, the instruction processing system 100 may comprise two modules that are configured to process NDF instructions, and two modules that are configured to process FX option instructions.

[0055] In one example, the instruction processing system 100 comprises one or more computers, and one or more software applications. Components of the instruction processing system 100 may reside and operate on a large multiprocessor computer system, such as an IBM pSeries computer running AIX. Components of the instruction processing system 100 may alternatively reside and operate on a computer system operating another version of the UNIX operating system, or on a computer system running other operating systems.

[0056] In one example, components of the instruction processing system 100 comprise software imple-mented using the C programming language and middleware, such as the IBM Continuous Toolkit System. In this example, data generated by, and used by, various components within the instruction processing system 100 are stored in one or more relational databases maintained by a relational database system, such as the IBM DB2 system. Alternatively, the instruction processing system 100 may be implemented entirely as hardware, such as one or more microprocessors or specialized circuitry, or as various other combinations of software and hardware.

Instruction Manager

[0057] The instruction manager 165 receives payment instructions, examines each respective payment instruction to determine the form of the relevant financial instrument to which the payment instruction relates, and forwards the payment instruction to the appropriate module 110, 120, 130, etc. The instruction manager 165 may comprise software, for example. Alternatively, the instruction manager 165 may comprise hardware, such as one or more micro-processors, specialized circuitry, or a combination of software and hardware.

[0058] FIG. 3 is a flowchart of an example of a method to identify a payment instruction and forward the payment instruction to an appropriate processor. At step 810, a payment instruction is received. In the example of FIG. 1, when a member, such as member A, B, C, etc., submits a payment instruction concerning a respective transaction, the member transmits the payment instruction via the network 108 to the instruction processing system 100. The payment instruction may relate to an FX transaction, an NDF transaction, an FX option transaction, etc. The interface 102 receives the payment instruction and forwards it to the instruction manager 165.

[0059] At step 820, the form of financial instrument to which the payment instruction relates is determined. In one example, the instruction manager 165 examines an indicator in the payment instruction, which may comprise a code, for example, that identifies the relevant form of financial instrument, i.e.. whether the payment instruction relates to an FX transaction, an NDF transaction, an EX option transaction, etc. Alternatively, the instruction manager 165 may determine the relevant form of financial instrument based on the format and/or contents of the payment instruction. At step 830, a processor configured to process the payment instruction is identified, based on the form of the relevant financial instrument. Thus, if the payment instruction is determined to be an FX instruction, the instruction manager 165 identifies the FX module 110. If the payment instruction is determined to be an NDF instruction, the instruction manager 165 identifies the NDF module 120. If the payment instruction is determined to be an FX option instruction, the instruction manager 165 identifies the FX option module 130. At step 840, the payment instruction is forwarded to the identified processor.

FX Module

[0060] When the instruction manager 165 receives a payment instruction from a member relating to an underlying deliverable FX transaction. the instruction manager 165 identifies it as an FX instruction and forwards the EX instruction to the FX module 110. The FX module 110 receives and processes FX instructions, and transmits settlement eligible instructions to the settlement engine 175. The FX module 110 may include software. specialized circuitry, or a combination of hardware and software, as discussed above.

Processing of FX Instructions

[0061] FIG. 4 is a flowchart of an example of a method to process FX instructions. in accordance with an embodiment of the invention. At step 210, the FX module 110 receives an FX instruction submitted by a member. At step 220, the FX module 110 accepts the FX instruction. The acceptance procedure is discussed above. Upon acceptance, a confirmation message may be transmitted to the member that submitted the FX instruction.

[0062] At step 230, the FX module 110 validates the FX instruction. The validation procedure is discussed above. FX instructions that are not successfully validated may be rejected or marked as invalid.

[0063] The FX module 110 attempts to establish an association between the FX instruction and a second FX instruction. In the illustrative example, at step 240, the FX module 110 attempts to "match" the FX instruction with a corresponding FX instruction relating to the same underlying FX transaction. Two corresponding FX instructions must be submitted by the members prior to either instruction becoming eligible for settlement. Thus, the instruction matching process attempts to compare one FX instruction with another FX instruction that relates to the same underlying transaction by matching certain information (including submitting member information, settlement date, currency codes and respective amounts bought and sold, for example).

[0064] For example. supposing member A is selling one million US Dollars to and buying X UK Pound

Sterling from member B, and member B is buying one million US Dollars from and selling X UK Pound Sterling to member A, each may submit a respective FX instruction to the instruction processing system 100. Each of the FX instructions is identified by the instruction manager 165 as an FX instruction and forwarded to the FX module 110. The FX module 110 accepts and validates each of the FX instructions, and then matches them based on information contained in the two FX instructions.

[0065] After the FX instruction is matched, at step 250 the FX module 110 applies a set of pre-settlement rules to the FX instruction. In the illustrative example, the FX module 110 automatically designates the FX instruction as a settlement eligible specifying a payment entitlement and obligation (buy and sell currency amounts). The settlement eligible instruction is transmitted to the settlement engine 175 (step 270) for settlement. Alternatively, a "new" settlement eligible instruction may be generated based on the FX instruct-tion and transmitted to the settlement engine 175.

NDF Module

[0066] When the instruction processing system 100 receives a payment instruction from a member relating to an underlying NDF transaction, the instruction manager 165 identifies it as an NDF instruction and forwards the NDF instruction to the NDF module 120. The NDF module 120 receives and processes NDF instructions, and generates settlement eligible instructions, which are transmitted to the settlement engine 175. The NDF module 120 may also com¬prise software, specialized circuitry, or a combination of hardware and software.

Processing of NDF Instructions

[0067] FIG. 5 is a flowchart of an example of a method to process NDF instructions, in accordance with an embodiment of the invention. The NDF module 110 at step 410 receives an NDF instruction (the "first NDF opening instruction") and processes it in a manner similar to the manner in which FX instructions are processed. Accordingly, NDF module 120 accepts (step 420) and validates (step 425) the first NDF opening instruction. The NDF module 120 also attempts to establish an association between the first NDF opening instruction and another NDF opening instruction, by matching the first NDF opening instruction with a second NDF opening instruction received from another member, at step 430.

[0068] After the first NDF opening instruction is matched, the NDF module 120 applies a set of pre-settlement rules to the first NDF opening instruction. In this example, an NDF opening instruction is not eligible for settlement until it is updated to include information received from a member regarding the valuation of the underlying NDF transaction. Such information may be submitted by a member in an additional instruction (an "NDF valuation instruction"). Thus, on or after the date the instruction processing system 100 received the first NDF opening instruction, the instruction processing system 100 receives a first NDF valuation instruction containing updating information pertain-ing to the first NDF opening instruction, at step 470. The instruction manager 165 analyzes the first NDF valuation instruction and forwards it to the NDF module 120. At step 470, the NDF module 120 receives the first NDF valuation instruction, and uses the first NDF valuation instruction to update the first NDF opening instruction (step 475). Similarly, a second NDF valuation instruction containing updating information pertaining to the second NDF opening instruction is received (step 478). and used to update the second NDF opening instruction (step 479). Alternatively, an NDF valuation instruction may be submitted and received prior to the receipt of the associated NDF opening instruction.

[0069] If the first and second NDF opening instructions remain matched after they have been updated by the first and second NDF valuation instructions, the NDF module 120 calculates an NDF settlement amount (in the appropriate currency) due from one member to another member in connection with the underlying NDF transaction, at step 485. At step 490, the NDF module 120 generates a settlement eligible instruction specifying a payment entitlement or obligation (the NDF settlement amount). based on the first and second NDF opening instructions and the first and second NDF valuation instructions. The calculated NDF settlement amount specified in the settlement eligible instruction represents the amount that must be paid by one member to another member on the settlement date specified in the instructions. The settlement eligible instruction is transmitted to the settlement engine 175 for settlement, at step 495.

[0070] In an alternative example, after the settlement amount is calculated (step 485). a pair of payment instructions is generated in a format suitable for processing by the FX module 110, based on the updated first NDF opening instruction and the updated second NDF opening instruction. In this example, the pair of payment instructions includes one "real" instruction containing information pertinent to the underlying financial instrument, including (i) an amount of a specified currency to be settled (for example, to be delivered), and (ii) zero units of a fictitious currency to be settled (for example, to be received). The pair of payment instructions also includes one associated "dummy" instruction that corresponds to the real instruction and contains information pertinent to the underlying financial instrument, including (i) an amount of a specified currency to be settled (for example, to be received), and (ii) zero units of a fictitious currency to be settled (for example, to be delivered). The "real" instruction and the "dummy" instruction are transmitted to the FX module 110 and processed and settled in the same manner as FX instructions, in accordance with the method shown in FIG. 4.

FX Option Module

[0071] When the instruction processing system 100 receives a payment instruction from a member relating to an underlying FX option transaction, the instruction manager 165 identifies it as an FX option instruction and forwards the FX option instruction to the FX option module 130. The FX option module 130 receives and processes FX option instructions, and generates settlement eligible instructions, which are transmitted to the settlement engine 175. The FX option module 130 may also comprise specialized hardware, software, or a combination of hardware and software.

Processing of FX Option Instructions

[0072] FIG. 6 is a flowchart of an example of a method to process an FX option instruction, in accordance with an embodiment of the invention. At step 510, the FX option modules 130 receives an FX option instruction and processes it in a manner similar to the manner in which FX instructions are processed. Accordingly, the FX option module 130 accepts the FX option instruction (step 520), validates the FX option instruction (step 530), and attempts to establish an association between the FX option instruction and another FX option instruction, by matching the FX option instruction with another FX option instruction received from another member (step 540).

[0073] Once the FX option instruction has been matched with another FX option instruction received from another member, the FX option module 130 applies a set of pre-settlement rules to the FX option instruction. In the illustrative example, the FX option module 130 at step 565 generates a settlement eligible instruction based on the matched FX option instruction and specifying a payment entitlement or obligation (option premium amount). The option premium amount specified in the settlement eligible instruction represents the option premium amount and currency that must be paid by one member to another member on the settlement date for the option premium payment. At step 570 the settlement eligible instruction is submitted for settlement to the settlement engine 175.

[0074] In an alternative example, after the FX option instruction is matched with another FX option instruction received from another member (step 540), a pair of payment instructions is generated in a format suitable for processing by the FX module 110, based on the two matched FX option instructions. In this example, the pair of payment instructions includes one "real" instruction containing information pertinent to the underlying financial instrument, including (i) an amount of a specified currency to be settled (for example, to be delivered), and (ii) zero units of a fictitious currency to be settled (for example, to be received). The pair of payment instructions also includes one associated "dummy" instruction that corresponds to the real instruction and contains information pertinent to the underlying financial instrument, including (i) an amount of a specified currency to be settled (for example, to be received), and (ii) zero units of a fictitious currency to be settled (for example, to be delivered). The "real" instruction and the "dummy" instruction are transmitted to the FX module 110 and processed and settled in the same manner as FX instructions, in accordance with the method shown in FIG. 4.

Settlement Engine

[0075] The settlement engine 175 receives settlement eligible instructions from the FX module 110, the NDF module 120, and the FX option module 130, and stores the various instructions. The settlement engine 175 facilitates the settlement of instructions by the managing entity 190. The settlement engine 175 may comprise software, hardware, or a combination of software and hardware.

[0076] It should be noted that in alternative examples, the functions of the settlement engine 175 may be performed by two or more separate processors. For example, in one alternative, FX instructions are settled via a first processor, NDF instructions are settled via a second processor, and FX option instructions are settled via a third processor.

[0077] The settlement engine 175 maintains a settlement processing queue. All instructions classified as settlement eligible prior to a predetermined time on the settlement date specified in the instruction are placed in the settlement processing queue. In one example, settlement eligible instructions are placed into the settlement processing queue in pairs. Settlement eligible instructions (including any pairs) may be placed in the queue in random order. In this example. other types of instructions, including same-day instructions, are placed in the settlement processing queue in sequential order immediately following the settlement eligible instructions that have been placed in the queue that day. For purposes of this document, the term "settlement member" means a member whose account with the managing entity 190 is used to settle instructions.

[0078] On a given day, the managing entity 190 examines the settlement eligible instructions placed in the settlement processing queue. After calculating the net projected position of each settlement member in each eligible currency, given the settlement instructions due to settle that day, the managing entity 190 issues initial pay-in schedules ("PIS"). The PIS is issued at a first predetermined time (Midnight 00:00 CET, for example). The PIS specifies the minimum amount of each currency which the settlement member must pay and the times by which the payment must be made.

[0079] At a second predetermined time (06:30 CET, for example), the managing entity 190 issues revised pay-in schedules, which supercede the PIS and reflect changes that result from submission of additional settlement instructions, such as "same-day instructions" (including, for example, instructions relating to the matching of previously unmatched instructions).

[0080] At a third predetermined time, the settlement processing begins. The settlement process includes three processes. First, the managing entity 190 credits the relevant settlement member's account for each confirmed pay-in made by the respective member. Second, the managing entity 190 evaluates each pair of settlement eligible instructions, in the order in which they appear in the settlement processing queue, to confirm that the accounts of the relevant settlement members satisfy selected criteria. Such criteria may include requirements concerning the settlement members' account balances, the currencies in which the settlement members have short balances, etc. Third, the managing entity 190 makes pay-outs in the currencies in which the settlement members have long balances.

[0081] The managing entity 190 performs these three phases repeatedly through the settlement processing cycle. In one example, the managing entity 190 may maintain and operate a computer system and specialized software configured to perform various steps of the settlement process. In effect, the managing entity 190 operates as a continuous linked process as it continually attempts to settle settlement instructions remaining in the settlement processing queue, while receiving pay-ins and making pay-outs of settlement proceeds as efficiently as possible.

[0082] In one example, members may submit, at predetermined times prior to settlement, one or more additional instructions to amend or rescind an instruction that was previously submitted to the system. Such additional instructions are, as appropriate, processed in a manner similar to that described above (for example, accepted and validated).

[0083] The foregoing merely illustrates the principles of the invention. It will thus be appreciated that those skilled in the art will be able to devise numerous other arrangements that embody the principles of the invention and are thus within the spirit and scope of the invention, which is defined by the claims below.

[0084] For example, the instruction processing system 100 and its components are disclosed herein in a form in which various functions are performed by discrete functional blocks. However, any one or more of these functions could equally well be embodied in an arrangement in which the functions of any one or more of those blocks or indeed, all of the functions thereof, are realized, for example, by one or more appropriately programmed processors.

We claim:

1. A system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

an interface configured to:

receive from participants a first instruction associated with a financial instrument of a first form and a second instruction associated with the financial instrument of the first form; and

receive from participants a first instruction associated with a financial instrument of a second form and a second instruction associated with the financial instrument of the second form;

a first processor configured to:

establish an association between the first and second instructions associated with the financial instrument of the first form; and apply a first set of pre-settlement rules to the first and second instructions associated with the financial instrument of the first form; and

a second processor configured to:

establish an association between the first and second instructions associated with the financial instrument of the second form; and

apply a second set of pre-settlement rules to the first and second instructions associated with the financial instrument of the second form.

2. The system of claim 1, further comprising:

a third processor configured to:

direct the first and second instructions associated with the financial instrument of the first form to the first processor; and

direct the first and second instructions associated with the financial instrument of the second form to the second processor.

3. The system of claim 1, wherein the financial instrument of the first form relates to at least one transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward transaction, and a foreign exchange option transaction.

4. The system of claim 1, wherein the financial instrument of the second form relates to at least one transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward transaction, and a foreign exchange option transaction.

5. The system of claim 1, wherein:

the first processor is further configured to:

accept the first and second instructions associated with the financial instrument of the first form; and

the second processor is further configured to:

accept the first and second instructions associated with the financial instrument of the second form.

6. The system of claim 5, wherein:

the first processor is further configured to:

validate the first and second instructions associated with the financial instrument of the first form; and

the second processor is further configured to:

validate the first and second instructions associated with the financial instrument of the second form.

7. The system of claim 6, wherein:

the first processor is configured to establish an association between the first and second instructions associated with the financial instrument of the first form by:

matching the first instruction associated with the financial instrument of the first form with the second instruction associated with the financial instrument of the first form; and

the second processor is configured to establish an association between the first and second instructions associated with the financial instrument of the second form by:

matching the first instruction associated with the financial instrument of the second form with the second instruction associated with the financial instrument of the second form.

8. The system of claim 7, wherein the first processor is configured to:

match the first instruction associated with the financial instrument of the first form with the second instruction associated with the financial instrument of the first form by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in the first instruction with a text field in the second instruction; a match, in accordance with specified criteria, of an amount in a field in the first instruction with an amount in a field in the second instruction; a match of an amount in a field of the first instruction with an amount within a specified tolerance in a field in the second instruction; and a match, in accordance with specified criteria, of a date in a field of the first instruction with a date in a field of the second instruction.

9. The system of claim 8, wherein the second processor is configured to:

match the first instruction associated with the financial instrument of the second form with the second instruction associated with the financial instrument of the second form by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in the first instruction with a text field in the second instruction; a match, in accordance with specified criteria, of an amount in a field in the first instruction with an amount in a field in the second instruction; a match of an amount in a field of the first instruction with an amount within a specified tolerance in a field in the second instruction; and a match, in accordance with specified criteria, of a date in a field of the first instruction with a date in a field of the second instruction.

10. The system of claim 7, wherein:

the first set of pre-settlement rules comprises:

designating the first instruction associated with the financial instrument of the first form and the second instruction associated with the financial instrument of the first form as first settlement eligible instructions, after the first and second instructions have been snatched; and

submitting the first settlement eligible instructions for settlement; and

the second set of pre-settlement rules comprises:

designating the first instruction associated with the financial instrument of the second form and the second instruction associated with the financial instrument of the second form as second settlement eligible instructions, after the first and second instructions have been matched: and

submitting the second settlement eligible instructions for settlement.

11. The system of claim 10, further comprising: a third processor configured to:

settle the first settlement eligible instructions and the second settlement eligible instructions.

12. The system of claim 7, wherein:

the first set of pre-settlement rules comprises:

generating one or more first settlement eligible instructions based on the first instruction associated with the financial instrument of the first form and the second instruction associated with the financial instrument of the first form, after the first and second instructions have been matched; and

submitting the one or more first settlement eligible instructions for settlement;

and the second set of pre-settlement rules comprises:

generating one or more second settlement eligible instructions based on the first instruction associated with the financial instrument of the second form and the second instruction associated with the financial instrument of the second form, after the instructions have been matched: and

submitting the one or more second settlement eligible instructions for settlement.

13. The system of claim 12, further comprising: a third processor configured to:

settle the first settlement eligible instructions and the second settlement eligible instructions.

14. The system of claim 1, wherein the participants are members of a special purpose bank.

15. The system of claim 14, wherein the participants maintain accounts with the special purpose bank.

16. The system of claim 1, wherein instructions are received in electronic form.

17. The system of claim 1, wherein the system is maintained by an entity, and each participant maintains at least one account with the entity.

18. The system of claim 17, wherein:

payment entitlements arising from an instruction received from a participant are automatically paid to the participant's account with the entity; and

payment obligations arising from an instruction received from a participant are automatically paid-out from the participant's account with the entity.

19. The system of claim 1. further comprising:

a third processor configured to:

settle the first and second instructions associated with the financial instrument of the first form; and

a fourth processor configured to:

settle the first and second instructions associated with the financial instrument of the second form.

20. The system of claim 19, wherein the third and fourth processors are the same.

21. The system of claim 19, wherein:

the first and second instructions associated with the financial instrument of the first form comprise payment instructions; and the first and second instructions associated with the financial instrument of the second form comprise payment instructions.

22. The system of claim 1. wherein:

the first and second instructions associated with the financial instrument of the first form comprise payment instructions; and

the first and second instructions associated with the financial instrument of the second form comprise payment instructions.

23. The system of claim 1. wherein:

the interface is further configured to:

receive from participants a first instruction associated with a financial instrument of a third form and a second instruction associated with the financial instrument of the third form; and

wherein the system further comprises:

a third processor configured to:

establish an association between the first and second instructions associated with the financial instrument of a third form; and

apply a third set of pre-settlement rules to the first and second instructions associated with the financial instrument of the third form.

24. The method of claim 1, wherein the second set of pre-settlement rules comprises:

generating two additional instructions based, at least in part, on the first and second instructions associated with the financial instrument of the second form; and transmitting the additional instructions to the first processor.

25. A system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

an interface configured to:

receive from participants a first instruction associated with a foreign exchange transaction and a second instruction associated with the foreign exchange transaction; and

receive from participants a first instruction associated with a non-deliverable forwards transaction and a second instruction associated with the non-deliverable forwards transaction;

a first processor configured to:

establish an association between the first and second instructions associated with the foreign exchange transaction; and

apply a first set of pre-settlement rules to the first and second instructions associated with the foreign exchange transaction; and

a second processor configured to:

establish an association between the first and second instructions associated with the non-deliverable for-wards transaction; and

apply a second set of pre-settlement rules to the first and second instructions associated with the non-deliverable forwards transaction.

26. The system of claim 25, wherein the first set of pre-settlement rules comprises:

automatically designating the first and second instructions associated with the foreign exchange transaction as settlement eligible after the association between the first and second instructions associated with the foreign exchange transaction is established.

27. The system of claim 25, wherein the first instruction associated with the non-deliverable forwards transaction comprises a first non-deliverable forwards opening instruction ("NDF opening instruction") and the second instruction associated with the non-deliverable forwards transaction comprises a second NDF opening instruction.

28. The system of claim 27, wherein:

the first processor is further configured to:

accept the first and second instructions associated with the foreign exchange transaction; and

the second processor is further configured to:

accept the first and second instructions associated with the non-deliverable forwards transaction.

29. The system of claim 28, wherein:

the first processor is further configured to:

validate the first and second instructions associated with the foreign exchange transaction; and

the second processor is further configured to:

validate the first and second instructions associated with the non-deliverable forwards transaction.

30. The system of claim 29, wherein:

the first processor is configured to establish an association between the first and second instructions associated with the foreign exchange transaction by:

matching the first instruction associated with the foreign exchange transaction with the second instruction associated with the foreign exchange transaction: and the second processor is configured to establish an association between the first and second instructions associated with the non-deliverable forwards transaction by:

matching the first instruction associated with the non-deliverable forwards transaction with the second instruction associated with the non-deliverable forwards transaction.

31. The system of claim 30, wherein the first processor is configured to:

match the first instruction associated with the foreign exchange transaction with the second instruction associated with the foreign exchange transaction by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in the first instruction with a text field in the second instruction; a match, in accordance with specified criteria, of an amount in a field in the first instruction with an amount in a field in the second instruction; a match of an amount in a field of the first instruction with an amount within a specified tolerance in a field in the second instruction; and a match, in accordance with specified criteria, of a date in a field of the first instruction with a date in a field of the second instruction.

32. The system of claim 31, wherein the second processor is configured to:

match the first instruction associated with the non-deliverable forwards transaction with the second instruction associated with the non-deliverable forwards transaction by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in the first instruction with a text field in the second instruction; a match, in accordance with specified criteria, of an amount in a field in the first instruction with an amount in a field in the second instruction; a match of an amount in a field of the first instruction with an amount within a specified tolerance in a field in the second instruction; and a match, in accordance with specified criteria, of a date in a field of the first instruction with a date in a field of the second instruction.

33. The system of claim 32, wherein the second set of pre-settlement rules comprises:

receiving a first valuation instruction comprising first additional information;

receiving a second valuation instruction comprising second additional information;

establishing a first association between the first valuation instruction and the first NDF opening instruction;

establishing a second association between the second valuation instruction and the second NDF opening instruction;

generating a settlement instruction based on information in the first valuation instruction, the first NDF opening instruction, the second valuation instruction, and the second NDF opening instruction; and

submitting the settlement instruction for settlement.

34. The system of claim 25, wherein instructions are received in electronic form.

35. The system of claim 25, wherein:

the first set of pre-settlement rules comprises:

designating as settlement eligible the first and second instructions associated with the foreign exchange transaction; and

submitting the first and second instructions associated with the foreign exchange transaction for settlement; and

the second set of pre-settlement rules comprises:

designating as settlement eligible the first and second instructions associated with the non-deliverable forwards transaction; and

submitting the first and second instructions associated with the non-deliverable forwards transaction for settlement.

36. The system of claim 35, further comprising:

a third processor configured to:

settle the first and second instructions associated with the foreign exchange transaction; and

a fourth processor configured to:

settle the first and second instructions associated with the non-deliverable forwards transaction.

37. The system of claim 36, wherein the third and fourth processors are the same.

38. The system of claim 25, wherein:

the first set of pre-settlement rules comprises:

generating one or more first settlement eligible instructions based, at least in part, on the first and second instructions associated with the foreign exchange transaction; and

submitting the one or more first settlement eligible instructions for settlement; and

the second set of pre-settlement rules comprises:

generating one or more second settlement eligible instructions based, at least in part, on the first and second instructions associated with the non-deliver-able forwards transaction; and

submitting the second settlement eligible instructions for settlement.

39. The system of claim 38, further comprising:

a third processor configured to:

settle the first settlement eligible instructions; and

a fourth processor configured to:

settle the second settlement eligible instructions.

40. The system of claim 39, wherein the third and fourth Irocessors are the same.

41. The system of claim 39, wherein:

the first instruction associated with the foreign exchange transaction and the second instruction associated with the foreign exchange transaction comprise payment instructions; and the first instruction associated with the non-deliverable forwards transaction and the second instruction associated with the non-deliverable forwards transaction comprise payment instructions.

42. The system of claim 25, wherein:

the first instruction associated with the foreign exchange transaction and the second instruction associated with the foreign exchange transaction comprise payment instructions; and

the first instruction associated with the non-deliverable forwards transaction and the second instruction associated with the non-deliverable forwards transaction comprise payment instructions.

43. The system of claim 25, wherein:

the interface is further configured to:

receive from participants a first instruction associated with a financial instrument of a third form and a second instruction associated with the financial instrument of the third form; and

wherein the system further comprises:

a third processor configured to:

establish an association between the first and second instructions associated with the financial instrument of a third form; and

apply a third set of pre-settlement rules to the first and second instructions associated with the financial instrument of the third form.

44. The system of claim 32, wherein the second set of pre-settlement rules comprises:

receiving a first valuation instruction comprising first additional information;

receiving a second valuation instruction comprising second additional information;

establishing a first association between the first valuation instruction and the first NDF opening instruction; and

establishing a second association between the second valuation instruction and the second NDF opening instruction.

45. The system of claim 44, wherein the second set of pre-settlement rules comprises:

generating two additional instructions based, at least in part, on the first and second NDF opening instructions; and

transmitting the additional instructions to the first processor.

46. A system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

an interface configured to:

receive from participants a first instruction associated with a foreign exchange transaction and a second instruction associated with the foreign exchange transaction; and

receive from participants a first instruction associated with a foreign exchange option transaction and a second instruction associated with the foreign exchange option transaction;

a first processor configured to:

establish an association between the first and second instructions associated with the foreign exchange transaction; and

apply a first set of pre-settlement rules to the first and second instructions associated with the foreign exchange transaction; and

a second processor configured to:

establish an association between the first and second instructions associated with the foreign exchange option transaction; and

apply a second set of pre-settlement rules to the first and second instructions associated with the foreign exchange option transaction.

47. The system of claim 46, wherein the first set of pre-settlement rules comprises:

automatically designating the first and second instructions associated with the foreign exchange transaction as settlement eligible after the association between the first and second instructions associated with the foreign exchange transaction is established.

48. The system of claim 46, wherein:

the first processor is further configured to:

accept the first and second instructions associated with the foreign exchange transaction; and

the second processor is further configured to:

accept the first and second instructions associated with the foreign exchange option transaction.

49. The system of claim 48, wherein:

the first processor is further configured to:

validate the first and second instructions associated with the foreign exchange transaction; and

the second processor is further configured to:

validate the first and second instructions associated with the foreign exchange option transaction.

50. The system of claim 49, wherein:

the first processor is configured to establish an association between the first and second instructions associated with the foreign exchange transaction by:

matching the first instruction associated with the foreign exchange transaction with the second instruction associated with the foreign exchange transaction; and

the second processor is configured to establish an association between the first and second instructions associated with the foreign exchange option transaction by:

matching the first instruction associated with the foreign exchange option transaction with the second instruction associated with the foreign exchange option transaction.

51. The system of claim 50, wherein the first processor is configured to:

match the first instruction associated with the foreign exchange transaction with the second instruction associated with the foreign exchange transaction by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in the first instruction with a text field in the second instruction; a match, in accordance with specified criteria, of an amount in a field in the first instruction with an amount in a field in the second instruction; a match of an amount in a field of the first instruction with an amount within a specified tolerance in a field in the second instruction; and a match, in accordance with specified criteria, of a date in a field of the first instruction with a date in a field of the second instruction.

52. The system of claim 51, wherein the second processor is configured to:

match the first instruction associated with the foreign exchange option transaction with the second instruction associated with the foreign exchange option transaction by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in the first instruction with a text field in the second instruction; a match, in accordance with specified criteria, of an amount in a field in the first instruction with an amount in a field in the second instruction; a match of an amount in a field of the first instruction with an amount within a specified tolerance in a field in the second instruction; and a match, in accordance with specified criteria, of a date in a field of the first instruction with a date in a field of the second instruction.

53. The system of claim 46, wherein instructions are received in electronic form.

54. The system of claim 46, wherein:

the first set of pre-settlement rules comprises:

designating as settlement eligible the first and second instructions associated with the foreign exchange transaction; and

submitting the first and second instructions associated with the foreign exchange transaction for settlement; and

the second set of pre-settlement rules comprises:

designating as settlement eligible the first and second instructions associated with the foreign exchange option transaction; and

submitting the first and second instructions associated with the foreign exchange option transaction for settlement.

55. The system of claim 54, further comprising: a third processor configured to:

settle the first and second instructions associated with the foreign exchange transaction; and

a fourth processor configured to:

settle the first and second instructions associated with the foreign exchange option transaction.

56. The system of claim 55, wherein the third and fourth processors are the same.

57. The system of claim 46, wherein:

the first set of pre-settlement rules comprises:

generating one or more first settlement eligible instructions based. at least in part, on the first and second instructions associated with the foreign exchange transaction; and submitting the one or more first settlement eligible instructions for settlement; and

the second set of pre-settlement rules comprises:

generating one or more second settlement eligible instructions based, at least in part, on the first and second instructions associated with the foreign exchange option transaction: and

submitting the second settlement eligible instructions for settlement.

58. The system of claim 57, further comprising:

a third processor configured to:

settle the first settlement eligible instructions; and

a fourth processor configured to:

settle the second settlement eligible instructions.

59. The system of claim 58, wherein the third and fourth processors are the same.

60. The system of claim 58, wherein:

the first instruction associated with the foreign exchange transaction and the second instruction associated with the foreign exchange transaction comprise payment instructions; and

the first instruction associated with the foreign exchange option transaction and the second instruction associated with the foreign exchange option transaction comprise payment instructions.

61. The system of claim 46, wherein:

the first instruction associated with the foreign exchange transaction and the second instruction associated with the foreign exchange transaction comprise payment instructions; and

the first instruction associated with the foreign exchange option transaction and the second instruction associated with the foreign exchange option transaction comprise payment instructions.

62. The system of claim 46, wherein:

the interface is further configured to:

receive from participants a first instruction associated with a financial instrument of a third form and a second instruction associated with the financial instrument of the third form; and

wherein the system further comprises:

a third processor configured to:

establish an association between the first and second instructions associated with the financial instrument of a third form; and

apply a third set of pre-settlement rules to the first and second instructions associated with the financial instrument of the third form.

63. The system of claim 46, wherein the second set of pre-settlement rules comprises:

generating at least two additional instructions based, at least in part, on the first and second instructions associated with the foreign exchange option transaction; and

transmitting the additional instructions to the first processor.

64. A system to process instructions relating to settlement of payments relating to transactions

involving financial instruments among multiple participants, comprising:

a first processor configured to:

apply a first set of pre-settlement rules to instructions relating to financial instruments of a first form;

a second processor configured to:

apply a second set of pre-settlement rules to instructions relating to financial instruments of a second form: and

a third processor configured to:

receive instructions relating to financial instruments of the first form and instructions relating to financial instruments of the second form; and

for each instruction:

determine whether the instruction relates to a financial instrument of the first form or to a financial instrument of the second form;

forward the instruction to the first processor, if the instruction relates to a financial instrument of the first form; and

forward the instruction to the second processor, if the instruction relates to a financial instrument of the second form.

65. The system of claim 64, wherein financial instruments of the first form relate to a transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward transaction. and a foreign exchange option transaction.

66. The system of claim 64, wherein financial instruments of the second form relate to a transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward transaction, and a foreign exchange option transaction.

67. The system of claim 64, wherein the third processor determines whether an instruction relates to a financial instrument of the first form or to a financial instrument of the second form by examining an indicator in the instruction.

68. The system of claim 67, wherein the indicator comprises a code indicating a form of financial instrument.

69. The system of claim 64, wherein the third processor determines whether an instruction relates to a financial instrument of the first form or to a financial instrument of the second form by examining a format of the instruction.

70. The system of claim 64, wherein:

the instructions relating to financial instruments of the first form comprise at least one payment instruction; and

the instructions relating to financial instruments of the second form comprise at least one payment instruction.

71. A system to facilitate settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

an interface configured to:

receive a plurality of instructions comprising instructions relating to at least two different forms of financial instruments;

a plurality of processors each configured to:

apply a respective set of pre-settlement rules to instructions relating to financial instruments of a respective form.

72. The system of claim 71, wherein the plurality of instructions comprises at least a first instruction and a second instruction; and

wherein:

the first instruction is associated with a first financial instrument relating to at least one transaction chosen from among the group consisting of: a foreign exchange transaction. a non-deliverable forward transaction, and a foreign exchange option transaction.

the second instruction is associated with a second financial instrument relating to at least one transaction chosen from among the group consisting of: a foreign exchange transaction. a non-deliverable forward transaction, and a foreign exchange option transaction.

73. The system of claim 71, further comprising: a controller configured to:

identify a type of financial instrument associated with an instruction; and

direct the instruction to a selected one of the plurality of processors configured to process instructions associated with financial instruments of the identified type.

74. A method to facilitate settlement of payments relating to transactions involving financial instruments among multiple participants, comprising;

receiving, by a first processor. instructions relating to financial instruments of a first form and instructions relating to financial instruments of a second form;and

for each instruction:

determining, by the first processor, whether the instruction relates to a financial instrument of the first form or to a financial instrument of the second form;

forwarding the instruction to a second processor configured to process instructions relating to financial instrument of the first form, if it is determined that the instruction relates to a financial instrument of the first form; and

forwarding the instruction to a third processor configured to process instructions relating to financial instrument of the second form, if it is determined that the instruction relates to a financial instrument of the second form.

75. The method of claim 74. wherein financial instruments of the first form relate to a transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward transaction, and a foreign exchange option transaction.

76. The method of claim 74. wherein financial instruments of the second form relate to a transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward

transaction, and a foreign exchange option transaction.

77. The method of claim 74, wherein the first processor determines whether the instruction relates to a financial instrument of the first form or to a financial instrument of the second form by examining an indicator in the instruction.

78. The method of claim 77, wherein the indicator comprises a code indicating a form of financial instrument.

79. The method of claim 74, wherein the first processor determines whether the instruction relates to a financial instrument of the first form or to a financial instrument of the second form by examining a format of the instruction.

80. The method of claim 74, wherein:

the instructions relating to financial instruments of the first form comprise at least one payment instruction; and

the instructions relating to financial instruments of the second form comprise at least one payment instruction.

81. A method for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

receiving from participants a first instruction associated with a financial instrument of a first form and a second instruction associated with the financial instrument of the first form;

receiving from participants a first instruction associated with a financial instrument of a second form and a second instruction associated with the financial instrument of the second form;

establishing, by a first processor, an association between the first and second instructions associated with the financial instrument of the first form;

applying, by the first processor, a first set of pre-settlement rules to the first and second instructions associated with the financial instrument of the first form;

establishing, by a second processor, an association between the first and second instructions associated with the financial instrument of the second form; and

applying, by the second processor, a second set of pre-settlement rules to the first and second instructions associated with the financial instrument of the second form.

82. The method of claim 81, further comprising:

directing, by a third processor, the first and second instructions associated with the financial instrument of the first form to the first processor; and

directing, by the third processor, the first and second instructions associated with the financial instrument of the second form to the second processor.

83. The method of claim 81, wherein the financial instrument of the first form relates to at least one transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward transaction, and a foreign exchange option transaction.

84. The method of claim 81, wherein the financial instrument of the second form relates to at least one transaction chosen from among the group consisting of: a foreign exchange transaction, a non-deliverable forward transaction, and a foreign exchange option transaction.

85. The method of claim 81, further comprising:

matching the first and second instructions associated with the financial instrument of the first form; and

matching the first and second instructions associated with the financial instrument of the second form.

86. The method of claim 85, further comprising:

designating the first and second instructions associated with the financial instrument of the first form as settlement eligible instructions; and

designating the first and second instructions associated with the financial instrument of the second form as settlement eligible instructions.

87. The method of claim 85, further comprising:

generating one or more settlement eligible instructions based on the first and second instructions associated with the financial instrument of the first form; and

generating one or more settlement eligible instructions based on the first and second instructions associated with the financial instrument of the second form.

88. The method of claim 86, further comprising: settling at least two corresponding settlement eligible instructions.

89. The method of claim 81, wherein the first processor are maintained by an entity, and each participant maintains at least one account with the entity.

90. The method of claim 89, further comprising:

paying-in automatically payment entitlements arising from an instruction received from a participant to the participant's account with the entity; and

paying-out automatically payment obligations arising from an instruction received from a participant's from the participant's account with the entity.

91. The method of claim 81, wherein:

The first instruction associated with the financial instrument of the first form and the second instruction associated with the financial instrument of the second form comprise payment instructions; and

The first instruction associated with the financial instrument of the second form and the second instruction associated with the financial instrument of the second form comprise payment instructions.

92. The method of claim 91, further comprising:

settling the first instruction associated with the financial instrument of the first form and the second instruction associated with the financial instrument of the first form.

93. The method of claim 91, further comprising:

settling the first instruction associated with the financial instrument of the second form and the second instruction associated with the financial instrument of the second form.

94. The method of claim 91, further comprising:

settling the first instruction associated with the financial instrument of the first form and the second instruction associated with the financial instrument of the first form; and

settling the first instruction associated with the financial instrument of the second form and the second instruction associated with the financial instrument of the second form.

* * * * *

EXHIBIT 3

In the Claims

1. (Currently Amended) A system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

at least one computer comprising:

an interface configured to:

receive from any of the multiple participants first instructions associated with first financial instruments of a first form and second instructions associated with the first financial instruments of the first form; and

receive from any of the multiple participants third instructions associated with second financial instruments of a second form, and fourth instructions associated with the second financial instruments of the second form, wherein the second form of the second financial ~~instrument~~ instruments is different from the first form of the first financial ~~instrument~~ instruments;

a first processor configured to:

establish associations between respective first and second instructions associated with the first financial instruments; and

apply a first set of pre-settlement rules to the respective associated first and second instructions associated with the first financial instruments; and

a second processor, different from the first processor, the second processor configured to:

establish associations between only respective third and fourth instructions associated with the second financial instruments; and

apply a second set of pre-settlement rules to the respective associated third and fourth instructions associated with only the second financial instruments.

2. (Previously Presented) The system of claim 1, wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

direct the first and second instructions associated with the first financial instruments to only the first processor; and

direct the third and fourth instructions associated with the second financial instruments to only the second processor.

3. (Currently Amended) The system of claim 1, wherein the first financial instruments relate to ~~at least~~ one form of transaction chosen from among the group consisting of: deliverable, non-option foreign exchange transactions, non-deliverable forward transactions, and foreign exchange option transactions.

4. (Currently Amended) The system of claim 1, wherein the second financial instruments relate to ~~at least~~ one form of transaction chosen from among the group consisting of: deliverable foreign exchange transactions, non-deliverable forward transactions, and foreign exchange option transactions.

5. (Previously Presented) The system of claim 1, wherein:

the first processor is further configured to:

accept the first and second instructions associated with the first financial instruments; and

the second processor is further configured to:

accept the third and fourth instructions associated with the second financial instruments.

6. (Previously Presented) The system of claim 5, wherein:

the first processor is further configured to:

validate the first and second instructions associated with the first financial instruments; and

the second processor is further configured to:

validate the third and fourth instructions associated with the second financial instruments.

7. (Previously Presented) The system of claim 6, wherein:

the first processor is configured to establish associations between respective first and second instructions associated with the first financial instruments by:

matching respective first and second instructions associated with the first financial instruments; and

the second processor is configured to establish associations between respective third and fourth instructions associated with the second financial instruments by:

matching respective third and fourth instructions associated with the second financial instruments.

8. (Previously Presented) The system of claim 7, wherein the first processor is configured to:

match the respective first and second instructions associated with the first financial instruments by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in a respective first instruction with a text field in a respective second instruction; a match, in accordance with specified criteria, of an amount in a field in a respective first instruction with an amount in a field in a respective second instruction; a match of an amount in a field of a respective first instruction with an amount within a specified tolerance in a field in a respective second instruction; and a match, in accordance with specified criteria, of a date in a field of a respective first instruction with a date in a field of a respective second instruction.

9. (Previously Presented) The system of claim 8, wherein the second processor is configured to:

match the respective third and fourth instructions associated with the second financial instruments by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in a respective third instruction with a text field in a respective fourth instruction; a match, in accordance with specified criteria, of an amount in a field in a respective third instruction with an amount in a field in a respective fourth instruction; a match of an amount in a field of a respective third instruction with an amount within a specified tolerance in a field in a respective fourth instruction; and a match, in accordance with specified criteria, of a date in a field of a respective third instruction with a date in a field of a respective fourth instruction.

10. (Previously Presented) The system of claim 7, wherein:

the first set of pre-settlement rules comprises:

designating respective matched first and second instructions associated with the first financial instruments as first settlement eligible instruction; and

submitting the first settlement eligible instructions for settlement; and the second set of pre-settlement rules comprises:

designating respective matched third and fourth instructions associated with the second financial instruments as second settlement eligible instructions; and

submitting the second settlement eligible instructions for settlement.

11. (Previously Presented) The system of claim 10, wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

settle the first settlement eligible instructions and the second settlement eligible instructions.

12. (Previously Presented) The system of claim 7, wherein:

the first set of pre-settlement rules comprises:

generating one or more first settlement eligible instructions based on the respective matched first and second instructions associated with the first financial instruments; and

submitting the one or more first settlement eligible instructions for settlement; and

the second set of pre-settlement rules comprises:

generating one or more second settlement eligible instructions based on the respective matched third and fourth instructions associated with the second financial instruments; and

submitting the one or more second settlement eligible instructions for

settlement.

13. (Previously Presented) The system of claim 12, wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

settle the first settlement eligible instructions and the second settlement eligible instructions.

14. (Original) The system of claim 1, wherein the participants are members of a special purpose bank.

15. (Original) The system of claim 14, wherein the participants maintain accounts with the special purpose bank.

16. (Previously Presented) The system of claim 1, wherein the first, second, third, and fourth instructions are received in electronic form.

17. (Currently Amended) The system of claim 1, further comprising:

an entity to maintain the ~~system~~ at least one computer, wherein each of the multiple participants maintains at least one account with the entity.

18. (Previously Presented) The system of claim 17, wherein:

payment entitlements arising from an instruction received from a first of the multiple participants are automatically paid to the first participant's account with the entity; and

payment obligations arising from an instruction received from a second of the multiple participants are automatically paid-out from the second participant's account with the entity.

19. (Previously Presented) The system of claim 1, wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

settle the associated first and second instructions associated with the financial instruments; and

a fourth processor, different from the first processor, the second processor, and the third processor, the fourth processor configured to:

settle the associated third and fourth instructions associated with the second financial instruments.

20. (Original) The system of claim 19, wherein the third and fourth processors are the same.

21. (Previously Presented) The system of claim 19, wherein:

the first and second instructions associated with the first financial instruments comprise payment instructions; and

the third and fourth instructions associated with the second financial instruments comprise payment instructions.

22. (Previously Presented) The system of claim 1, wherein:

the first and second instructions associated with the first financial instruments comprise payment instructions; and

the third and fourth instructions associated with the second financial instruments comprise payment instructions.

23. (Currently Amended) The system of claim 1, wherein:

the interface is further configured to:

receive from any of the multiple participants fifth instructions associated with third financial instruments of a third form and sixth instructions associated with the third financial instruments of the third form, wherein the third form of the third financial ~~instruments~~ instruments is different from the first form of the first financial ~~instrument~~ instruments and the second form of the second financial ~~instrument~~ instruments; and

wherein the at least one computer further comprises:

a third processor, separate from the first and second processors, the third processor configured to:

establish associations between respective fifth and sixth instructions associated with only the third financial instruments; and

apply a third set of pre-settlement rules to the respective associated fifth and sixth instructions associated with only the third financial instruments.

24. (Currently Amended) The system of claim 1, wherein the second set of pre-settlement rules comprises:

generating two additional instructions based, at least in part, on the respective associated third and fourth instructions associated with the second financial instruments; and

transmitting the additional instructions to the second first processor.

25. (Currently Amended) A system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

at least one computer comprising:

an interface configured to:

receive from any of the multiple participants first instructions associated with deliverable foreign exchange transactions and second instructions associated with the deliverable foreign exchange transactions; and

receive from any of the multiple participants third instructions associated with non-deliverable forwards transactions and fourth instructions associated with the non-deliverable forwards transactions;

a first processor configured to:

establish associations between respective first and second instructions associated with the deliverable foreign exchange transactions; and

apply a first set of pre-settlement rules to the respective associated first and second instructions associated with the deliverable foreign exchange transactions; and

a second processor, different from the first processor, the second processor configured to:

establish associations between only the respective third and fourth instructions associated with the non-deliverable forwards transactions; an

apply a second set of pre-settlement rules to the respective associated third and fourth instructions associated with only the non-deliverable forwards transactions.

26. (Previously Presented) The system of claim 25, wherein the first set of pre-settlement rules comprises:

automatically designating the associated first and second instructions associated with the deliverable foreign exchange transactions as settlement eligible.

27. (Previously Presented) The system of claim 25, wherein the third instructions associated with the non-deliverable forwards transactions comprise first non-deliverable forwards opening instructions ("NDF opening instructions") and the fourth instructions associated with the non-deliverable forwards transactions comprise second NDF opening instructions.

28. (Previously Presented) The system of claim 27, wherein:

the first processor is further configured to:

accept the first and second instructions associated with the deliverable foreign exchange transactions; and

the second processor is further configured to:

accept the third and fourth instructions associated with the non-deliverable forwards transactions.

29. (Currently Amended) The system of claim 28, wherein:

the first processor is further configured to:

validate the first and second instructions associated with the deliverable foreign exchange transactions; and

the second processor is further configured to:

validate the third and fourth instructions associated with the non-deliverable forwards transactions.

30. (Previously Presented) The system of claim 29, wherein:

the first processor is configured to establish associations between the respective first and second instructions associated with the deliverable foreign exchange transactions by:

matching respective first and second instructions associated with the deliverable foreign exchange transactions; and

the second processor is configured to establish associations between respective third and fourth instructions associated with the non-deliverable forwards transactions by:

matching respective third and fourth instructions associated with the non-deliverable forwards transactions.

31. (Previously Presented) The system of claim 30, wherein the first processor is configured to:

match the respective first and second instructions associated with the deliverable foreign exchange transactions by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in a respective first instruction with a text field in a respective second instruction; a match, in accordance with specified criteria, of an amount in a field in a respective first instruction with an amount in a field in a respective second instruction; a match of an amount in a field of a respective first instruction with an amount within a specified tolerance in a field in a respective second instruction; and a match, in accordance with specified criteria, of a date in a field of a respective first instruction with a date in a field of a respective second instruction.

32. (Previously Presented) The system of claim 31, wherein the second processor is

configured to: match the respective third and fourth instructions associated with the non-deliverable forwards transactions by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in a respective third instruction with a text field in a respective fourth instruction; a match, in accordance with specified criteria, of an amount in a field in a respective third instruction with an amount in a field in a respective fourth instruction; a match of an amount in a field of a respective third instruction with an amount within a specified tolerance in a field in a respective fourth instruction; and a match, in accordance with specified criteria, of a date in a field of a respective third instruction with a date in a field of a respective fourth instruction.

33. (Previously Presented) The system of claim 32, wherein the second set of pre-settlement rules comprises:

receiving first valuation instructions comprising first additional information;

receiving second valuation instructions comprising second additional information;

establishing first associations between respective first valuation instructions and respective first NDF opening instructions;

establishing second associations between respective second valuation instructions and respective second NDF opening instructions;

generating respective settlement instructions based on information in respective first valuation instructions, first NDF opening instructions, second valuation instructions, and second NDF opening instructions; and

submitting the settlement instructions for settlement.

34. (Previously Presented) The system of claim 25, wherein the first, second, third, and fourth instructions are received in electronic form.

35. (Previously Presented) The system of claim 25, wherein:

the first set of pre-settlement rules comprises:

designating as settlement eligible respective associated first and second instructions associated with the deliverable foreign exchange transactions; and

submitting the respective associated first and second instructions associated with the deliverable foreign exchange transactions for settlement; and

the second set of pre-settlement rules comprises:

designating as settlement eligible the respective associated third and fourth instructions associated with the non-deliverable forwards transactions; and

submitting the respective associated third and fourth instructions associated with the non-deliverable forwards transactions for settlement.

36. (Previously Presented) The system of claim 35, wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

settle the respective associated first and second instructions associated with the deliverable foreign exchange transactions; and

a fourth processor, different from the first processor, the second processor, and the third processor, the fourth processor configured to:

settle the respective associated third and fourth instructions associated with the non-deliverable forwards transactions.

37. (Original) The system of claim 36, wherein the third and fourth processors are the same.

38. (Previously Presented) The system of claim 25, wherein:

the first set of pre-settlement rules comprises:

generating one or more first settlement eligible instructions based, at least in part, on the respective associated first and second instructions associated with the deliverable foreign exchange transactions; and

submitting the one or more first settlement eligible instructions for settlement; and

the second set of pre-settlement rules comprises:

generating one or more second settlement eligible instructions based, at least in part, on the respective associated third and fourth instructions associated with the non-deliverable forwards transactions; and

submitting the second settlement eligible instructions for settlement.

39. (Previously Presented) The system of claim 38, wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

settle the first settlement eligible instructions; and

a fourth processor, different from the first processor, the second processor, and the third processor, the fourth processor configured to:

settle the second settlement eligible instructions.

40. (Original) The system of claim 39, wherein the third and fourth processors are the same.

41. (Previously Presented) The system of claim 39, wherein:

the first and second instructions associated with the deliverable foreign exchange transactions comprise payment instructions; and

the third and fourth instructions associated with the non-deliverable forwards transactions comprise payment instructions.

42. (Previously Presented) The system of claim 25, wherein:

the first and second instructions associated with the deliverable foreign exchange transactions comprise payment instructions; and

the third and fourth instructions associated with the non-deliverable forwards transactions comprise payment instructions.

43. (Previously Presented) The system of claim 25, wherein:

the interface is further configured to:

receive from any of the multiple participants fifth and sixth instructions associated with third financial transactions of a third form; and

wherein the system further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

establish associations between the respective fifth and sixth instructions associated with only the third financial instruments; and apply a third set of pre-settlement rules to the respective associated fifth and sixth instructions associated with the third financial instruments.

44. (Previously Presented) The system of claim 32, wherein the second set of pre-settlement rules comprises:

receiving first valuation instructions comprising first additional information;

receiving second valuation instructions comprising second additional information;

establishing first associations between respective first valuation instructions and respective first NDF opening instructions; and

establishing second associations between respective second valuation instructions and respective second NDF opening instructions.

45. (Currently Amended) The system of claim 44, wherein the second set of pre-settlement rules further comprises:

generating two additional instructions based, at least in part, on the respective first and second NDF opening instructions; and

transmitting the additional instructions to the second first processor.

46. (Currently Amended) A system for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

at least one computer comprising:

an interface configured to:

receive from any of the multiple participants first instructions associated with non-option foreign exchange transactions and second instructions associated with the non-option foreign exchange transactions; and

receive from any of the multiple participants third instructions associated with foreign exchange option transactions and fourth instructions associated with the foreign exchange option transactions;

a first processor configured to:

establish associations between respective first and second instructions associated with the non-option foreign exchange transactions; and

apply a first set of pre-settlement rules to the respective associated first and second instructions associated with the non-option foreign exchange transactions; and

a second processor different from the first processor, the second processor configured to:

establish associations between only respective third and fourth instructions associated with the non-option foreign exchange option transactions; and

apply a second set of pre-settlement rules to the respective associated third and fourth instructions associated with only the foreign exchange option transactions.

47. (Currently Amended) The system of claim 46, wherein the first set of pre-settlement rules comprises:

automatically designating the first and second instructions associated with the non-option foreign exchange transactions as settlement eligible after each association between the first and second instructions associated with ~~each~~ the foreign exchange transaction is established.

48. (Previously Presented) The system of claim 46, wherein:

the first processor is further configured to:

accept the first and second instructions associated with the non-option foreign exchange transactions; and

the second processor is further configured to:

accept the third and fourth instructions associated with the foreign exchange option transactions.

49. (Previously Presented) The system of claim 48, wherein:

the first processor is further configured to:

validate the first and second instructions associated with the non-option foreign exchange transactions; and

the second processor is further configured to:

validate the third and fourth instructions associated with the foreign exchange option transactions.

50. (Previously Presented) The system of claim 49, wherein:

the first processor is configured to establish associations between respective first and second instructions associated with the non-option foreign exchange transactions by:

matching respective first and second instructions associated with the non-option foreign exchange transactions; and

the second processor is configured to establish associations between only respective third and fourth instructions associated with the foreign exchange option transactions by:

matching respective third and fourth instructions associated with only the foreign exchange option transactions.

51. (Previously Presented) The system of claim 50, wherein the first processor is configured to:

match the respective first and second instructions associated with the non-option foreign exchange transactions by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in a respective first instruction with a text field in a respective second instruction; a match, in accordance with specified criteria, of an amount in a field in a respective first instruction with an amount in a field in a respective second instruction; a match of an amount in a field of a respective first instruction with an amount within a specified tolerance in a field in a respective second instruction; and a match, in accordance with specified criteria, of a date in a field of a respective first instruction with a date in a field of a respective second instruction.

52. (Previously Presented) The system of claim 51, wherein the second processor is configured to:

match the respective third and fourth instructions associated with the foreign exchange option transactions by identifying one or more matches chosen from the group consisting of:

a match, in accordance with specified criteria, of a text field in a respective third instruction with a text field in a respective fourth instruction; a match, in accordance with specified criteria, of an amount in a field in a respective third instruction with an amount in a field in a respective fourth instruction; a match of an amount in a field of a respective third instruction with an amount within a specified tolerance in a field in a respective fourth instruction; and a match, in accordance with specified criteria, of a date in a field of a respective third instruction with a date in a field of a respective fourth instruction.

53. (Previously Presented) The system of claim 46, wherein the first, second, third, and fourth instructions are received in electronic form.

54. (Previously Presented) The system of claim 46, wherein:

the first set of pre-settlement rules comprises:

designating as settlement eligible the respective associated first and second instructions associated with the non-option foreign exchange transactions; and

submitting the respective associated first and second instructions associated with the non-option foreign exchange transactions for settlement; and

the second set of pre-settlement rules comprises:

designating as settlement eligible the respective associated third and fourth instructions associated with the foreign exchange option transactions; and submitting the respective associated third and fourth instructions associated with the foreign exchange option transactions for settlement.

55. (Previously Presented) The system of claim 54, wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

settle the respective associated first and second instructions associated with the non-option foreign exchange transactions; and

a fourth processor, different from the first processor, the second processor, and the third processor, the fourth processor configured to:

settle the respective associated third and fourth instructions associated with the foreign exchange option transactions.

56. (Original) The system of claim 55, wherein the third and fourth processors are the same.

57. (Previously Presented) The system of claim 46, wherein:

the first set of pre-settlement rules comprises:

generating one or more first settlement eligible instructions based, at least in part, on the respective associated first and second instructions associated with the non-option foreign exchange transactions; and

submitting the one or more first settlement eligible instructions for settlement; and

the second set of pre-settlement rules comprises:

generating one or more second settlement eligible instructions based, at least in part, on the respective associated third and fourth instructions associated with the foreign exchange option transactions; and

submitting the second settlement eligible instructions for settlement.

58. (Original) The system of claim 57, wherein the at least one computer further comprises:

a third processor configured to:

settle the first settlement eligible instructions; and

a fourth processor configured to:

settle the second settlement eligible instructions.

59. (Original) The system of claim 58, wherein the third and fourth processors are the same.

60. (Previously Presented) The system of claim 58, wherein:

the first and second instructions associated with the non-option foreign exchange transactions comprise payment instructions; and

the third and fourth instructions associated with the foreign exchange option transactions comprise payment instructions.

61. (Previously Presented) The system of claim 46, wherein:

the first and second instructions associated with the foreign exchange transactions comprise payment instructions; and the third and fourth instructions associated with the foreign exchange option transactions comprise payment instructions.

62. (Previously Presented) The system of claim 46, wherein:

the interface is further configured to:

receive from any of the multiple participants fifth and sixth instructions associated with third financial instruments of a third form; and

wherein the at least one computer further comprises:

a third processor, different from the first processor and the second processor, the third processor configured to:

establish associations between respective fifth and sixth instructions associated with only the third financial instruments; and

apply a third set of pre-settlement rules to the respective associated fifth and sixth instructions associated with only the third financial instruments.

63. (Currently Amended) The system of claim 46, wherein the second set of pre-settlement rules further comprises:

generating at least two additional instructions based, at least in part, on the third and fourth instructions associated with the foreign exchange option transactions; and

transmitting the additional instructions to the first processor.

64. - 80. (Cancelled).

81. (Previously Presented) A method for facilitating settlement of payments relating to transactions involving financial instruments among multiple participants, comprising:

receiving from any of the multiple participants first instructions associated with first financial instruments of a first form and second instructions associated with the first financial instruments of the first form, by at least one computer;

receiving from any of-the multiple participants third instructions associated with second financial instruments of a second form and fourth instructions associated with the second financial instruments of the second form, wherein the second financial instrument of the second form is different from the first financial instrument of the first form, by the at least one computer;

establishing, by a first processing module of the at least one computer, associations between respective first and second instructions associated with the first financial instruments;

applying, by the first processing module, a first set of pre-settlement rules to the respective associated first and second instructions associated with the first financial instruments;

establishing, by a second processing module, of the at least one computer, different from the first processing module, associations between only respective third and fourth instructions associated with the second financial instruments; and

applying, by the second processing module, a second set of pre-settlement rules to the respective associated third and fourth instructions associated with only the second financial instruments.

82. (Previously Presented) The method of claim 81, further comprising:

directing, by a third processing module of the at least one computer, the first and second instructions associated with the first financial instruments to the first processing module, the third processing module being different from the first and second processing modules; and

directing, by the third processing module, the third and fourth instructions associated with the second financial instruments to the second processing module.

83. (Currently Amended) The method of claim 81, wherein the first financial instruments relate to ~~at least~~ one form of transaction chosen from among the group consisting of: deliverable, non-option foreign exchange transactions, non-deliverable forward transactions, and foreign exchange option transactions.

84. (Currently Amended) The method of claim 81, wherein the second financial instruments relate to ~~at least~~ one form of transaction chosen from among the group consisting of: deliverable, non-option foreign exchange transactions, non-deliverable forward transactions, and foreign exchange option transactions.

85. (Previously Presented) The method of claim 81, further comprising:

matching the first and second instructions associated with the first financial instruments, by the first processing module; and matching the third and fourth instructions associated with the second financial instruments, by the second processing module.

86. (Previously Presented) The method of claim 85, further comprising:

designating the respective associated first and second instructions associated with the first financial instruments as settlement eligible instructions, by the first processing module; and

designating the respective associated third and fourth instructions associated with the second financial instruments as settlement eligible instructions, by the second processing module.

87. (Previously Presented) The method of claim 85, further comprising:

generating one or more settlement eligible instructions based on the respective associated first and second instructions associated with the first financial instruments, by the first processing module; and

generating one or more settlement eligible instructions based on the third and fourth instructions associated with the second financial instruments, by the second processing module.

88. (Original) The method of claim 86, further comprising:

settling at least two corresponding settlement eligible instructions.

89. (Previously Presented) The method of claim 81, wherein the first and the second processing modules are maintained by an entity, and each of the multiple

participants maintains at least one account with the entity.

90. (Previously Presented) The method of claim 89, further comprising:

paying-in automatically payment entitlements arising from an instruction received from a first of the multiple participants to the first participant's account with the entity; and

paying-out automatically payment obligations arising from an instruction received from a second of the multiple participants from the second participant's account with the entity.

91. (Previously Presented) The method of claim 81, wherein:

the first and second instructions associated with the first financial instruments comprise payment instructions; and

the third and fourth instructions associated with the second financial instruments comprise payment instructions.

92. (Previously Presented) The method of claim 91, further comprising:

settling the respective associated first and second instructions associated with the first financial instruments.

93. (Previously Presented) The method of claim 91, further comprising:

settling the respective associated third and fourth instructions associated with the second financial instruments.

94. (Previously Presented) The method of claim 91, further comprising:

settling the respective associated first and second instructions associated with the first financial instruments; and

settling the respective associated third and fourth instructions associated with the second financial instruments.

EXHIBIT 4

[Logo] UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450 Alexandria, VA 22313-1450
www.uspto.gov

MEMORANDUM

DATE: August 24, 2009
TO: TC Directors
FROM: Andrew H. Hirshfeld
Acting Deputy Commissioner for Patent Examination Policy

SUBJECT: Effective Today: New Interim Patent Subject Matter Eligibility Examination Instructions

Effective today, the attached "Interim Examination Instructions For Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101" are applicable and should be used during examination. These Instructions supersede previous guidance on subject matter eligibility that conflicts with the Instructions, including MPEP 21060V), 2106.01 and 2106.02.

INTERIM EXAMINATION INSTRUCTIONS FOR EVALUATING SUBJECT MATTER ELIGIBILITY UNDER 35 U.S.C. § 101

I. OVERVIEW

The state of the law with respect to subject matter eligibility is in flux. The following interim instructions are for examination guidance pending a final decision from the Supreme Court in *Bilski v. Kappos*. These examination instructions do not constitute substantive rulemaking and hence do not have the force and effect of law. Rejections will be based upon the substantive law, and it is these rejections that are appealable. Consequently, any perceived failure by Office personnel to follow these instructions is neither appealable nor petitionable.

35 U.S.C. § 101 establishes the threshold for patentability by setting requirements for subject matter that is eligible for patenting. To pass the threshold eligibility inquiries of § 101 for patent protection, a claimed invention must be directed to statutory subject matter and must be useful. (§ 101 also provides the basis for the prohibition against double patenting.) Thus, under § 101 two separate patent eligibility considerations are raised: (1) subject matter and (2) utility.

To evaluate utility or the real world use of an invention, follow the detailed "utility" guidelines in MPEP 2107. Following the utility guidelines, the claims and supporting disclosure must be reviewed to evaluate whether the claimed invention has an asserted or well-established utility that is specific, substantial and credible. The usefulness of the invention must be commensurate with the broadest reasonable interpretation of the claimed invention in light of the specification as it would be interpreted by one of ordinary skill in the art.

This document includes instructions for evaluating subject matter eligibility and, for the interim, should be used for examining claims under 35 U.S.C. § 101 for subject matter eligibility. Since the subject matter eligibility guidelines set forth in MPEP 2106 were prepared, case law has developed that has necessitated revision to the guidelines. The following instructions supersede previous guidance on subject matter eligibility that conflicts with the Instructions, including MPEP 2106(W), 2106.01 and 2106.02.

Subject Matter Eligibility: There are two criteria for determining subject matter eligibility and both must be satisfied. The claimed invention (1) must be directed to one of the four statutory categories, and (2) must not be wholly directed to subject matter encompassing a judicially recognized exception, as defined below. The following two step analysis is used to evaluate these criteria.

1. Step 1: Is the claim directed to one of the four patent-eligible subject matter categories: process, machine, manufacture, or composition of matter?

The subject matter of the claim must be directed to one of the four subject matter categories. If it is not, the claim is not eligible for patent protection and should be rejected under § 101, for at least this reason.

A summary of the four categories of invention, as they have been defined by the courts, are:

i. Process — an act, or a series of acts or steps that are tied to a particular machine or apparatus or transform a particular article into a different state or thing.

ii. Machine — a concrete thing, consisting of parts, or of certain devices and combination of devices. This includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result.

iii. Manufacture — an article produced from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery.

iv. Composition of matter — all compositions of two or more substances and all composite articles, whether they be the results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids, for example.

Non-limiting examples of claims that are not directed to one of the statutory categories:

i. Transitory forms of signal transmission (for example, a propagating electrical or electromagnetic signal *per se).*

ii. A naturally occurring organism.

iii. A human *per se*.

iv. A legal contractual agreement between two parties.

v. A game defined as a set of rules.

vi. A computer program *per se*.

vii. A company.

A claim that covers both statutory and non-statutory embodiments (under the broadest reasonable interpretation of the claim when read in light of the specification and in view of one skilled in the art) embraces subject matter that is not eligible for patent protection and therefore is directed to non-statutory subject matter. Such claims fail the first step and should be rejected under § 101, for at least this reason. For example, a claim to a computer readable medium that can be a compact disc or *a carrier wave* covers a non-statutory embodiment and therefore should be rejected under § 101 as being directed to non-statutory subject matter.

If the claimed invention is clearly not within one of the four categories, it is not patent eligible. However, when the claim fails under Step 1 and it appears from applicant's disclosure that the claim could be amended to be directed to a statutory category, Step 2 below should still be conducted.

2. Step 2: Does the claim wholly embrace a judicially recognized exception, which includes abstract ideas, mental processes or substantially all practical uses (pre-emption) of a law of nature or a natural phenomenon, or is it a particular practical application of a judicial exception?

In addition to the terms abstract ideas, mental processes, laws of nature and natural phenomena, judicially recognized exceptions have been described using various other terms, including physical phenomena, scientific principles, systems that depend on human intelligence alone, disembodied concepts, and disembodied mathematical algorithms and formulas, for example. The exceptions reflect the courts' view that the basic tools of scientific and technological work are not patentable.

The claimed subject matter must not be wholly directed to a judicially recognized exception. If it is, the claim is not eligible for patent protection and should be rejected under § 101. However, a claim that is limited to a particular practical application of a judicially recognized exception is eligible for patent protection. A "practical application" relates to how a judicially recognized exception is applied in a real world product or a process, and not merely to the result achieved by the invention. When subject matter has been reduced to a particular practical application having a real world use, the claimed practical application is evidence that the subject matter is not abstract, not purely mental and does not encompass substantially all uses (pre-emption) of a law of nature or a natural phenomenon.

II. PARTICULAR PRACTICAL APPLICATION

A. Machines, manufactures, and compositions of matter (products)

If the claimed product falls within one of the three product categories of invention and does not recite judicially excepted subject matter, e.g., an abstract idea, a mathematical algorithm, a law of nature, or a natural phenomenon, it qualifies as eligible subject matter. If a judicial exception is recited in the claim, it must be determined if the judicially excepted subject matter has been practically applied in the product.

Eligible machines, manufactures, and compositions of matter are non-naturally occurring products typically formed of tangible elements or parts that embody a particular or specific, tangible practical application of the invention. Thus, for these product categories, a particular practical application is often self-evident based on the claim limitations that define the tangible embodiment. This is because an idea that is tangibly applied to a structure is no longer abstract, and a law of nature or natural phenomenon that is practically applied to a structure is limited to that particular application of the concept. For example, a cup is the tangible application of the abstract idea of containing a liquid and is one limited embodiment of that idea (which is no longer abstract). As another example, a magnetic door latch is the tangible application of the concept of magnetism and does not wholly embrace the concept of magnetism but, rather, is one limited application of the concept.

A claim that includes terms that imply that the invention is directed to a product, for instance by reciting "a machine comprising . . .", but fails to include tangible limitations in accordance with its broadest reasonable interpretation is not limited to a practical application, but rather wholly embraces or encompasses the concept upon which the invention is based. This is impermissible as such claim coverage would extend to every way of applying the abstract idea, law of nature or natural phenomenon.

A claim that includes judicially excepted subject matter and whose broadest reasonable interpretation is directed to a man-made tangible embodiment (i.e., structure) with a real world use is limited to a practical application (the subject matter has been practically applied). The reason is that the claim as a whole must be evaluated for eligibility in the same manner that a claim as a whole is evaluated for patentability under §§ 102, 103 and 112.

Once a practical application has been established, the limited occurrence of preemption must be evaluated to determine whether the claim impermissibly covers substantially all practical applications of the judicially excepted subject matter. If so, the claim is not patent-eligible. If the claim covers only a particular practical application of the judicially excepted subject matter, it is patent eligible.

Judicially excepted subject matter is often claimed as descriptive material. Descriptive material should be evaluated to determine if the material has a functional relationship to the underlying structure in order to evaluate whether it creates a patentable distinction over the prior art or whether it is merely non-functional descriptive material that creates no patentable distinction. For example, printed matter on an object or mere data (e.g., music) stored in a memory is typically non-functional descriptive material that would not create a patentable distinction over the prior art. Conversely, a printed circuit board or a computer programmed with executable instructions is typically construed as a base structure combined with functional descriptive material that could create a patentable distinction over the prior art.

The following examples show the difference between a tangible embodiment that is evidence of a particular practical application and an abstract concept that has no practical application.

(a) A claim that is directed to a machine comprising a plurality of structural elements that work together in a defined combination based on a mathematical relationship, such as a series of gears, pulleys and belts, possesses structural limitations that show that it is a tangible embodiment, providing evidence that the mathematical relationship has been applied (a practical application). Additionally, that tangible embodiment is limited by the claimed structure and would not cover all substantial practical uses of the mathematical relationship. The claim would be eligible for patent protection.

(b) On the other hand, a claim that is directed to a machine ("What is claimed is a machine that operates in accordance with F=ma.") and includes no tangible structural elements under the broadest reasonable interpretation, covers the operating principle based on a mathematical relationship with no limits on the claim scope. Thus, as no tangible embodiment is claimed, there would be no evidence of a practical application. The claim would wholly embrace the mathematical concept of F=ma and would not be eligible subject matter.

(c) As another example, a claim to a non-transitory, tangible computer readable storage medium *per se* that possesses structural limitations under the broadest reasonable interpretation standard to qualify as a manufacture would be patent-eligible subject matter. Adding additional claim limitations to the medium, such as executable instructions or stored data, to such a statutory eligible claim would not render the medium non-statutory, so long as the claim as a whole has a real world use and the medium does not cover substantially all practical uses of a judicial exception. The claim as a whole remains a tangible embodiment and qualifies as a manufacture. As explained above, the additional claim limitations would be evaluated in terms of whether they distinguish over the prior art.

B. Processes (methods)

A process claim, to be statutory under § 101, must pass the machine-or-transformation test (M-or-T test), which ensures that the process is limited to a particular practical application. Thus, not every claimed method qualifies as a statutory process. The test ensures that the process is not simply claiming an abstract idea, a mental process or substantially all practical uses of (pre-empting) a law of nature or a natural phenomenon.

In accordance with the M-or-T test, the claimed process must:

(1) be tied to a particular machine or apparatus (machine implemented); or

(2) particularly transform a particular article to a different state or thing.

A method claim that does not require machine implementation or does not cause a transformation will fail the test and should be rejected under § 101.

However, the mere presence of a machine tie or transformation is not sufficient to pass the test. When a machine tie or transformation has been identified, it must be further determined that the tie is to a particular machine or the particular transformation is of a particular article.

Additionally, the particular machine tie or particular transformation must meet two corollaries to pass the test for subject matter eligibility. First, the use of the particular machine or transformation of the particular article must impose a meaningful limit on the claim's scope. So, a machine tie in only a field-of-use limitation would not be sufficient. Second, the use of the particular machine or the transformation of the particular article must involve more than insignificant "extra-solution" activity. If the machine or transformation is only present in a field-of-use limitation or in a step that is only insignificant "extra-solution" activity, the claim fails the M-or-T test, despite the presence of a machine or a transformation in the claim.

Using the terms within the machine-or-transformation test:

> A "machine" is a concrete thing, consisting of parts, or of certain devices and combination of devices. This includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result. This definition is interpreted broadly to include electrical, electronic, optical, acoustic, and other such devices that accomplish a function to achieve a certain result. The machine should implement the process, and not merely be an object upon which the process operates. The claim should be clear as to how the machine implements the process, rather than simply stating "a machine implemented process". The machine limitations should make clear that the use of the machine in the claimed process imposes a meaningful limitation on the claim's scope. An "apparatus" does not have a significantly different meaning from a machine and can include a machine or group of machines or a totality of means by which a designated function or specific task is executed.
>
> An "article" includes a physical object or substance. The physical article or substance must be particular, meaning it can be specifically identified. An article can also be electronic data

that represents a physical object or substance. For the test, the data should be more than an abstract value. Data can be specifically identified by indicating what the data represents, the particular type or nature of the data, and/or how or from where the data was obtained.

"Transformation" of an article means that the "article" has *changed* to a different state or thing. Changing to a different state or thing usually means more than simply using an article or changing the location of an article. A new or different function or use can be evidence that an article has been transformed. Manufactures and compositions of matter are the result of transforming raw materials into something new with a different function or use. Purely mental processes in which thoughts or human based actions are "changed" are not considered an eligible transformation. For data, mathematical manipulation *per se* has not been deemed a transformation; but, transformation of electronic data has been found when the nature of the data has been changed such that it has a different function or is suitable for a different use.

A "particular" machine or apparatus or transformation of a "particular" article means that the method involves a *specific* machine or article, not any and all machines or articles. This ensures that the machine or transformation imposes real world limits on the claimed method by limiting the claim scope to a particular practical application.

For computer implemented processes, the "machine" is often disclosed as a general purpose computer. In these cases, the general purpose computer may be sufficiently "particular" when programmed to perform the process steps. Such programming creates a new machine because a general purpose computer, in effect, becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software. To qualify as a particular machine under the test, the claim must clearly convey that the computer is programmed to perform the steps of the method because such programming, in effect, creates a special purpose computer limited to the use of the particularly claimed combination of elements (i.e., the programmed instructions) performing the particularly claimed combination of functions. If the claim is so abstract and sweeping that performing the process as claimed would cover substantially all practical applications of a judicial exception, such as a mathematical algorithm, the claim would not satisfy the test as the machine would not be sufficiently particular.

A "field-of-use" limitation does not impose *actual boundaries* on the scope of the claimed invention. A field-of-use limitation merely indicates that the method is for use in a particular environment, such as "for use with a machine" or "for transforming an article", which would not require that the machine implement the method or that the steps of the method cause the article to transform. A field-of-use limitation does not impose a meaningful limit on the claimed invention.

Insignificant "extra-solution" activity means activity that is not central to the purpose of the method invented by the applicant. For example, gathering data to use in the method when all applications of the method would require some form of data gathering would not impose a meaningful limit on the claim.

III. Interim Examining Procedure for Subject Matter Eligibility Determinations

Based on the guidance above, the following procedure should be followed during examination:

1. Determine the meaning of the claim.

Initially, the meaning of the claim as a whole must be determined using the "broadest reasonable interpretation" standard, which requires that the claims be given their broadest reasonable interpretation consistent with the specification and consistent with the interpretation that those skilled in the art would reach. See MPEP 2111 for a complete discussion of claim interpretation. See also MPEP 2111.02 for how to determine whether a preamble limits a claim.

2. Determine if the claim as a whole falls within one of the four categories of invention (Step 1 in section I above).

When the claim has been properly interpreted, conduct Step 1 to determine if the claim falls within one of the four statutory categories of invention. If the claim covers subject matter outside of the four categories, reject the claim because it is directed to non-statutory subject matter. Additionally, in the interest of compact prosecution, if it appears from the specification that the claim could be amended to fall within a statutory category, it is suggested to proceed to Step 2 to evaluate practical application.

3. Determine if the claim as a whole is directed to a particular practical application of a judicial exception (abstract idea, law of nature or natural

phenomenon) or a judicial exception in its entirety (Step 2 in section I above).

a. Products (see the attached flowchart and the discussion above regarding practical application):

When no judicially excepted subject matter is present in a claim and the claim satisfies Step 1, the subject matter of the claim is statutory (patent-eligible).

When a judicially recognized exception is present in the claim, determine if the claim recites structural limitations for it to qualify as a practical application of the judicial exception. A manmade tangible embodiment with a real world use is evidence of a practical application. If the claim does not recite a tangible embodiment (has no practical application), reject the claim as being directed to non-statutory subject matter. If the claim recites a tangible embodiment, the next step is to confirm that the claim does not cover substantially all practical uses of the judicial exception (the limited occurrence of preemption). When the claim is limited to a particular practical application (i.e., no preemption is found), the claim is directed to statutory subject matter and is eligible. If preemption is found because substantially all practical uses of the judicial exception are covered, the claim should be rejected under § 101 because it is directed to non-statutory subject matter.

b. Processes (see the attached flowchart and the discussion above regarding practical application):

For ease of implementation of this interim guidance, conduct the machine-or-transformation test for all method claims. For purposes of efficiency, it is recommended that the claim be first evaluated for the presence of the prong (M or T) most likely to be satisfied in the particular technological field because once one prong is satisfied, it is not necessary to evaluate the claim under the other prong. For example, in the mechanical and electrical arts, it may be more likely that a process is machine implemented, while in the chemical arts it may be more likely that a process results in a transformation of a substance.

Using the broadest reasonable interpretation of the claim, identify a machine or transformation, either explicitly or inherently, in the claim.

> If no machine or transformation is present, reject the claim because it is directed to non-statutory subject matter as it does not qualify as a statutory process and state on the record that no machine or transformation is present in the claim. Additional explanation should be provided if it could be argued that a machine or transformation is inherent to the claim but is not required under the broadest reasonable interpretation.
>
> If a machine or transformation is present, determine if the machine or article is "particular". If the machine or article transformed covers all machines or transformation of all articles and/or cannot be specifically identified, it is not "particular". Reject the claim because it is directed to non-statutory subject matter as it does not qualify as a statutory process. State on the record why the machine or article is not "particular".
>
> If a particular machine or transformation of a particular article is found, confirm that the particular machine or transformation meets the two corollaries. (1) Confirm that the use of the

particular machine or the transformation of the particular article imposes a meaningful limitation on the claim's scope by, for example, being present in more than a mere field-of-use limitation. (2) Confirm that the use of the particular machine or the transformation of the particular article involves more than insignificant extra-solution activity. If a particular machine or transformation is not found and it appears from applicant's disclosure that the claim could be amended to include a particular machine or transformation, in the interest of compact prosecution, the corollaries should also be addressed.

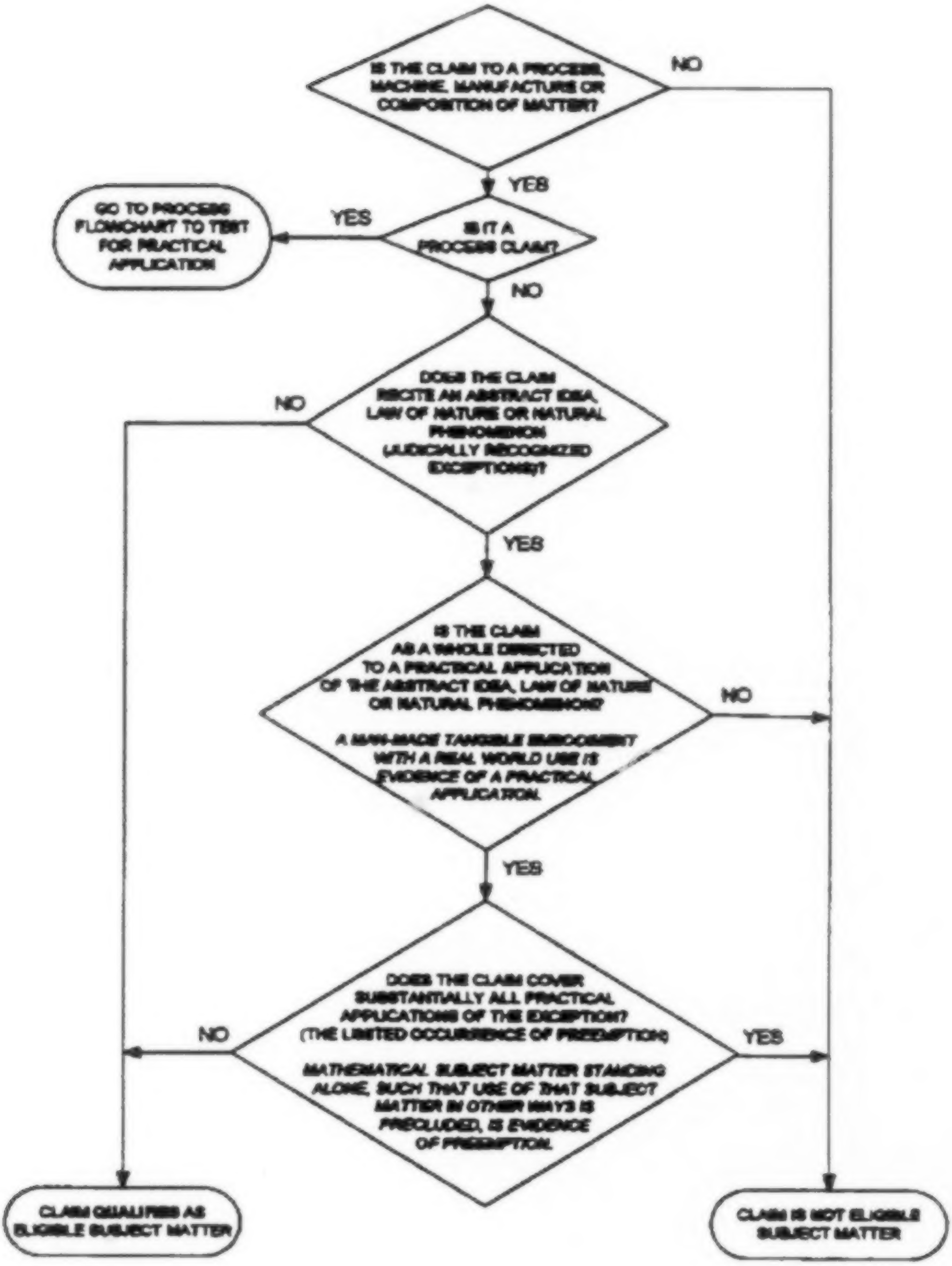
If the corollaries are confirmed, the claim is a statutory process. If the corollaries are not met, reject the claim because it is directed to non-statutory subject matter as it does not qualify as a statutory process. State on the record why the machine or transformation is not adequate to pass the test (e.g., the method does not pass the machine-or-transformation test as the [identify the particular machine or transformation] [does not impose a meaningful limit on the claim's scope or merely involves extra-solution activity in this method] because [provide specific reasons]).

When the machine or article is inherently, and not explicitly, required by the claimed method, and the examiner believes that the record of the prosecution as a whole does not make clear that the method involves a particular machine or a particular article, the examiner should identify the inherent machine on the record. The record should also be clear as to which step (or steps) invokes the machine or article. Such reasoning may be stated on the record, preferably as early as possible during prosecution. Such reasoning, if provided, will assist in understanding the broadest reasonable interpretation given to the claim during examination.

Confirm that the machine-or-transformation test was conducted correctly by considering whether the method is so abstract and sweeping as to have no real world application or pre-empts substantially all practical uses of a mathematical algorithm, a law of nature or a natural phenomenon. In either case, the claim would be ineligible and should not have passed the M-or-T test.

4. When the subject matter eligibility analysis is concluded, continue full examination on the merits of the claims, including evaluating utility under § 101, statutory and non-statutory double patenting, compliance with § 112, novelty under § 102, and non-obviousness under § 103.

SUBJECT MATTER ELIGIBLITY TEST


IS THE CLAIM TO A PROCESS, MACHINE, MANUFACTURE OR COMPOSITION OF MATTER?
NO
YES
GO TO PROCESS FLOWCHART TO TEST FOR PRACTICAL APPLICATION
YES
IS IT A PROCESS CLAIM?
NO
DOES THE CLAIM RECITE AN ABSTRACT IDEA, LAW OF NATURE OR NATURAL PHENOMENON (JUDICIALLY RECOGNIZED EXCEPTIONS)?
NO
YES
IS THE CLAIM AS A WHOLE DIRECTED TO A PRACTICAL APPLICATION OF THE ABSTRACT IDEA, LAW OF NATURE OR NATURAL PHENOMENON?
A MAN-MADE TANGIBLE EMBODIMENT WITH A REAL WORLD USE IS EVIDENCE OF A PRACTICAL APPLICATION.
NO
YES
DOES THE CLAIM COVER SUBSTANTIALLY ALL PRACTICAL APPLICATIONS OF THE EXCEPTION? (THE LIMITED OCCURRENCE OF PREEMPTION)
MATHEMATICAL SUBJECT MATTER STANDING ALONE, SUCH THAT USE OF THAT SUBJECT MATTER IN OTHER WAYS IS PRECLUDED, IS EVIDENCE OF PREEMPTION.
NO
YES
CLAIM QUALIFIES AS ELIGIBLE SUBJECT MATTER
CLAIM IS NOT ELIGIBLE SUBJECT MATTER

SUBJECT MATTER ELIGIBILITY TEST
(M-OR-T) FOR PROCESS CLAIMS

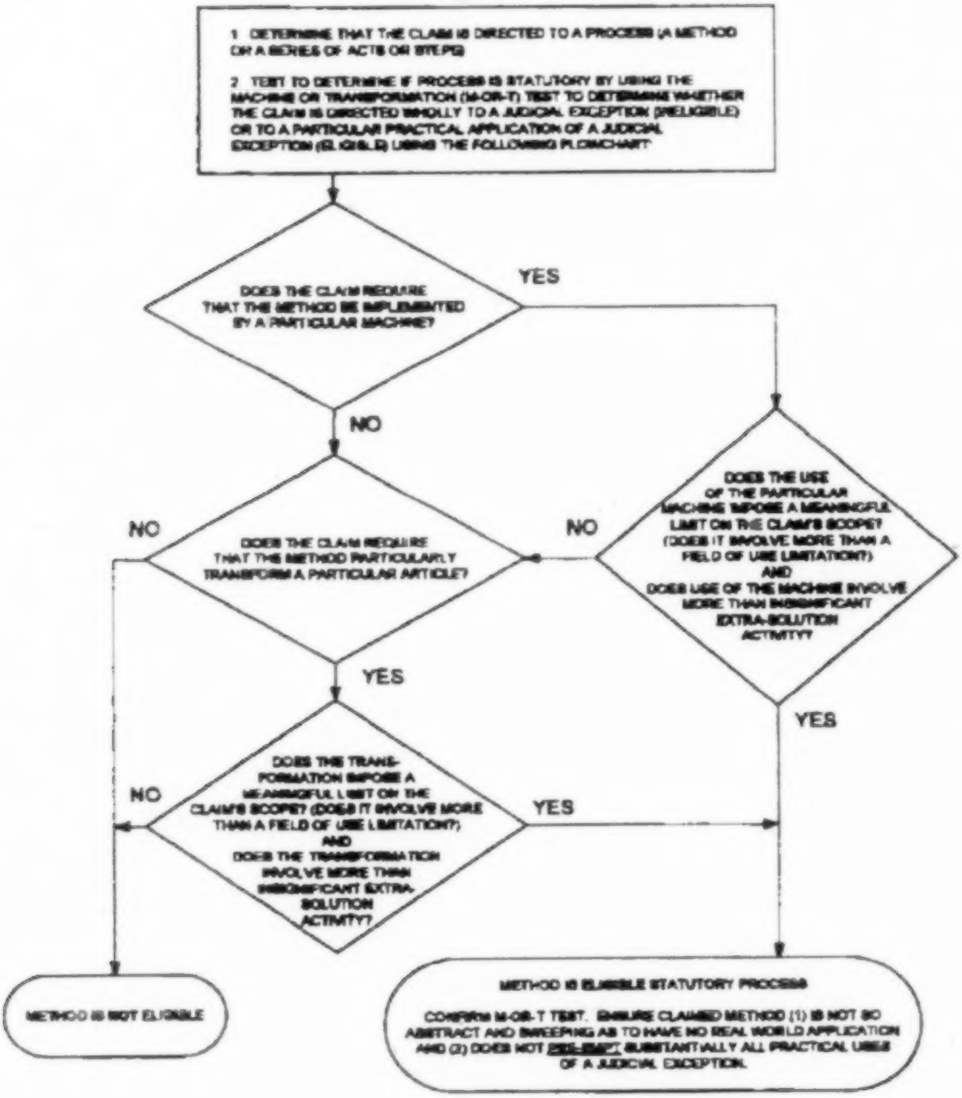

1. DETERMINE THAT THE CLAIM IS DIRECTED TO A PROCESS (A METHOD OR A SERIES OF ACTS OR STEPS)
2. TEST TO DETERMINE IF PROCESS IS STATUTORY BY USING THE MACHINE OR TRANSFORMATION (M-OR-T) TEST TO DETERMINE WHETHER THE CLAIM IS DIRECTED WHOLLY TO A JUDICIAL EXCEPTION (INELIGIBLE) OR TO A PARTICULAR PRACTICAL APPLICATION OF A JUDICIAL EXCEPTION (ELIGIBLE) USING THE FOLLOWING FLOWCHART
DOES THE CLAIM REQUIRE THAT THE METHOD BE IMPLEMENTED BY A PARTICULAR MACHINE?
YES
NO
DOES THE USE OF THE PARTICULAR MACHINE IMPOSE A MEANINGFUL LIMIT ON THE CLAIM'S SCOPE? (DOES IT INVOLVE MORE THAN A FIELD OF USE LIMITATION?) AND DOES USE OF THE MACHINE INVOLVE MORE THAN INSIGNIFICANT EXTRA-SOLUTION ACTIVITY?
NO
NO
DOES THE CLAIM REQUIRE THAT THE METHOD PARTICULARLY TRANSFORM A PARTICULAR ARTICLE?
YES
YES
DOES THE TRANSFORMATION IMPOSE A MEANINGFUL LIMIT ON THE CLAIM'S SCOPE? (DOES IT INVOLVE MORE THAN A FIELD OF USE LIMITATION?) AND DOES THE TRANSFORMATION INVOLVE MORE THAN INSIGNIFICANT EXTRA-SOLUTION ACTIVITY?
NO
YES
METHOD IS NOT ELIGIBLE
METHOD IS ELIGIBLE STATUTORY PROCESS
CONFIRM M-OR-T TEST. ENSURE CLAIMED METHOD (1) IS NOT SO ABSTRACT AND SWEEPING AS TO HAVE NO REAL WORLD APPLICATION AND (2) DOES NOT PRE-EMPT SUBSTANTIALLY ALL PRACTICAL USES OF A JUDICIAL EXCEPTION.

EXHIBIT 5

DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

[Docket No. PTO-P-2010-0067]

Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of Bilski v. Kappos

AGENCY: United States Patent and Trademark Office, Commerce.

ACTION: Notice; Request for comments.

SUMMARY: The United States Patent and Trademark Office (USPTO or Office) has prepared *Interim Guidance for Determining Subject Matter Eligibility for Process Claims in view of Bilski v. Kappos* (*Interim Bilski Guidance*) for its personnel to use when determining subject matter eligibility under 35 U.S.C. 101 in view of the recent decision by the United States Supreme Court (Supreme Court) in *Bilski v. Kappos*, No. 08-964 (June 28, 2010). It is intended to be used by Office personnel as a supplement to the previously issued *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. 101* dated August 24, 2009 (*Interim Instructions*) and the memorandum to the Patent Examining Corps on the Supreme Court Decision in *Bilski v. Kappos* dated June 28, 2010. This guidance supersedes previous guidance on subject matter eligibility that conflicts with the *Interim Bilski Guidance.* Any member of the public may submit written comments on the Interim Bilski Guidance. The Office is especially interested in receiving comments regarding the scope and extent of the holding in *Bilski*.

DATES: The *Interim Bilski* Guidance is effective July 27, 2010. This guidance applies to all applications filed before, on or after the effective date of July 27, 2010.

Comment Deadline Date: To be ensured of consideration, written comments must be received on or before September 27, 2010. No public hearing will be held.

ADDRESSES: Comments concerning this *Interim Bilski* Guidance should be sent by electronic mail message over the Internet addressed to *Bilski—Guidance@uspto.gov* or facsimile transmitted to (571) 2730125. Comments may also be submitted by mail addressed to: Mail Stop Comments—Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. Although comments may be submitted by facsimile or mail, the Office prefers to receive comments via the Internet.

The comments will be available for public inspection at the Office of the Commissioner for Patents, located in Madison East, Tenth Floor, 600 Dulany Street, Alexandria, Virginia, and will be available via the USPTO Internet Web site, (*address: http://www.uspto.gov*). Because comments will be available for public inspection, information that is not desired to be made public, such as an address or phone number, should not be included in the comments.

FOR FURTHER INFORMATION CONTACT: Caroline D. Dennison, Legal Advisor, Office of Patent Legal Administration, Office of the Associate Commissioner for Patent Examination Policy, by telephone at (571) 272-7729, or by mail addressed to: Mail Stop Comments—Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, marked to the attention of Caroline D. Dennison.

SUPPLEMENTARY INFORMATION: The USPTO has prepared interim guidance (*Interim Bilski Guidance*) for its personnel to use when determining subject matter eligibility under 35 U.S.C. 101 in view of the recent decision by the United States Supreme Court (Supreme Court) in *Bilski*. It is intended to be used by Office personnel as a supplement to the previously issued *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. 101* dated August 24, 2009 (Interim Instructions) and the memorandum to the Patent Examining Corps on the Supreme Court Decision in *Bilski v. Kappos* dated June 28, 2010. The *Interim Bilski* Guidance is based on the USPTO's current understanding of the law and is believed to be fully consistent with the decision in *Bilski,* the binding precedent of the Supreme Court, the U.S. Court of Appeals for the Federal Circuit (Federal Circuit) and the Federal Circuit's predecessor courts. The USPTO has also posted the *Interim Bilski Guidance* on its Internet Web site (*http://www.uspto.gov*).

Request for Comments

The Office has received and considered the comments regarding the *Interim Instructions* submitted in response to the *Request for Comments on Interim Examination Instructions for Evaluating Patent Subject Matter Eligibility*, 74 FR 47780 (Sept. 11, 2009), 1347 Off. Gaz. Pat. Office 110 (Oct. 13, 2009). *See also Additional Period for Comments on Interim Examination Instructions for Evaluating Patent Subject Matter Eligibility,* 74 FR 52184 (Oct. 9, 2009), 1348 Off. Gaz. Pat. Office 42 (Nov. 3, 2009) (extending the comment period until November 9, 2009).

Members of the public are invited to review the *Interim Bilski Guidance* (below) and provide comments.

The Office is particularly interested in receiving comments in response to the following questions:

1. What are examples of claims that do not meet the machine-or-transformation test but nevertheless remain patent-eligible because they do not recite an abstract idea?

2. What are examples of claims that meet the machine-or-transformation test but nevertheless are not patent-eligible because they recite an abstract idea?

3. The decision in *Bilski* suggested that it might be possible to "defin[e] a narrower category or class of patent applications that claim to instruct how business should be conducted," such that the category itself would be unpatentable as "an attempt to patent abstract ideas." *Bilski* slip op. at 12. Do any such "categories" exist? If so, how does the category itself represent an "attempt to patent abstract ideas?"

Interim Guidance for Determining Subject Matter Eligibility for Process Claims in view of *Bilski v. Kappos* (*Interim Bilski Guidance*)

I. Overview: This *Interim Bilski Guidance* is for determining patent-eligibility of process claims under 35 U.S.C. 101 in view of the opinion by the Supreme Court in *Bilski v. Kappos*, 561 U.S. ___ (2010), which refined the abstract idea exception to subject matter that is eligible for patenting. A claim to an abstract idea is not a patent-eligible process.

This *Interim Bilski Guidance* provides factors to consider in determining subject matter eligibility of method claims in view of the abstract idea exception. Although this guidance presents a change in existing examination practice, it is anticipated that subject matter eligibility determinations will not increase in complexity for the large majority of examiners, who do not routinely encounter claims that implicate the abstract idea exception.

Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement for patentability in the initial review of the application, even if one or more claims are found to be deficient with respect to the patent-eligibility requirement of 35 U.S.C. 101. Thus, Office personnel should state all non-cumulative reasons and bases for rejecting claims in the first Office action.

Section III of this *Interim Bilski Guidance* provides guidance on the abstract idea exception to subject matter eligibility as set forth in *Bilski*, and section IV of this *Interim Bilski Guidance* provides guidance on factors relevant to reviewing method claims for subject matter eligibility in view of *Bilski*. To aid examiners in implementing this guidance, a summary sheet of factors which may be useful for determining subject matter eligibility of a method claim is provided at the end of this *Interim Bilski Guidance*.

Section V of this *Interim Bilski Guidance* discusses how to make the determination of eligibility. To summarize, in order for the examiner to make a proper *prima facie* case of ineligibility, the examiner will evaluate the claim as a whole and weigh the relevant factors set forth in *Bilski* and previous Supreme Court precedent and make a determination of compliance with the subject matter eligibility prong of § 101. The Office will then consider rebuttal arguments and evidence supporting subject matter eligibility.

II. *SUMMARY*: The *Bilski* Court underscored that the text of § 101 is expansive, specifying four independent categories of inventions eligible for protection, including processes, machines, manufactures, and compositions of matter. See slip op. at 4 ("In choosing such expansive terms * * * modified by the comprehensive 'any', Congress plainly contemplated that the patent laws would be given wide scope.") (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980)). The Court also made clear that business methods are not "categorically outside of § 101's scope," stating that "a business method is simply one kind of 'method' that is, at least in some circumstances, eligible for patenting under § 101." *Id.* at 10-11. Examiners are reminded that § 101 is not the sole tool for determining patentability; where a claim encompasses an abstract idea, sections 102, 103, and 112 will provide additional tools for ensuring that the claim meets the conditions for patentability. As the Court made clear in *Bilski*:

> The § 101 patent-eligibility inquiry is only a threshold test. Even if an invention qualifies as a process, machine, manufacture, or composition of matter, in order to receive the Patent Act's protection the claimed invention must also satisfy "the conditions and requirements of this title." § 101. Those requirements include that the invention be novel, see § 102, nonobvious, see § 103, and fully and particularly described, see § 112.

Id. at 5.

Therefore, examiners should avoid focusing on issues of patent-eligibility under § 101 to the detriment of considering an application for compliance with the requirements of §§ 102, 103, and 112, and should avoid treating an application solely on the basis of patent-eligibility under § 101 except in the most extreme cases.

III. *The Abstract Idea Exception to Subject Matter Eligibility*: There are limits on the scope of patent-eligibility. In particular, the Supreme Court has identified three specific exceptions to § 101's broad patent-eligibility principles: Laws of nature, physical phenomena, and abstract ideas. *See id.*

The Office has been using the so-called "machine-or-transformation" test used by the Federal Circuit to evaluate whether a method claim qualifies as a statutory patent-eligible process. *See Interim Examination Instructions For Evaluating Subject Matter Eligibility Under 35 U.S.C. 101* dated August 24, 2009 ("*2009 Interim Instructions*"). The Supreme Court stated in *Bilski* that the machine-or-transformation test is a "useful and important clue" and "investigative tool" for determining whether some claimed methods are statutory processes, but it "is not the sole test for deciding whether an invention is a patent-eligible 'process.' "Slip op. at 8. Its primary objection was to the elevation of the machine-or-transformation test—which it considered to be "atextual"—as the "sole test" for patent-eligibility. Slip op. at 6-8, 16. To date, no court, presented with a subject matter eligibility issue, has ever ruled that a method claim that lacked a machine or a transformation was patent-eligible. However, *Bilski* held open the possibility that some claims that do not meet the machine-or-transformation test might nevertheless be patent-eligible.

Prior to adoption of the machine-or-transformation test, the Office had used the "abstract idea" exception in cases where a claimed "method" did not sufficiently recite a physical instantiation. *See, e.g., Ex parte*

Bilski, No. 2002-2257, slip op. at 46-49 (B.P.A.I. Sept. 26, 2006) (informative), *http://www.uspto.gov/ip/boards/bpai/decisions/inform/fd022257.pdf.* Following *Bilski*, such an approach remains proper. A claim that attempts to patent an abstract idea is ineligible subject matter under 35 U.S.C. 101. *See* slip op. at 13 ("[A]ll members of the Court agree that the patent application at issue here falls outside of § 101 because it claims an abstract idea."). The abstract idea exception has deep roots in the Supreme Court's jurisprudence. *See id*. at 5 (citing *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 174-175 (1853)).

Bilski reaffirmed *Diehr's* holding that "while an abstract idea, law of nature, or mathematical formula could not be patented, 'an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.'" *Id*. at 14 (quoting *Diamond v. Diehr*, 450 U.S. 175, 187 (1981)) (emphasis in original). The recitation of some structure, such as a machine, or the recitation of some transformative component will in most cases limit the claim to such an application. However, not all such recitations necessarily save the claim: "*Flook* established that limiting an abstract idea to one field of use or adding token postsolution components did not make the concept patentable." *Id*. at 15. Moreover, the fact that the steps of a claim might occur in the "real world" does not necessarily save it from a section 101 rejection. Thus, the *Bilski* claims were said to be drawn to an "abstract idea" despite the fact that they included steps drawn to initiating transactions. The "abstractness" is in the sense that there are no limitations as to the mechanism for entering into the transactions.

Consistent with the foregoing, *Bilski* holds that the following claim is abstract:

1. A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:

> (a) Initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;
>
> (b) Identifying market participants for said commodity having a counter-risk position to said consumers; and
>
> (c) Initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

Specifically, the Court explains:

> The concept of hedging, described in claim 1 and reduced to a mathematical formula in claim 4, is an unpatentable abstract idea, just like the algorithms at issue in Benson and Flook. Allowing petitioners to patent risk hedging would preempt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.

Slip op. at 15.

Bilski also held that the additional, narrowing, limitations in the dependent claims were mere field of use limitations or insignificant postsolution components, and that adding these limitations did not make the claims patent-eligible. *See id*. Claims 1-9 in *Bilski* are attached as examples of claims that run afoul of the abstract idea exception.

The day after deciding *Bilski*, the Supreme Court denied certiorari in *Ferguson v. Kappos*, U.S. Supreme Court No. 09-1501, while granting, vacating, and remanding two other Federal Circuit section 101 cases. The denial of certiorari left intact the rejection of all of *Ferguson's* claims. Although the Federal Circuit had applied the machine-or-transformation test to reject Ferguson's process claims, the Supreme Court's disposition of Ferguson makes it likely that the *Ferguson* claims also run afoul of the abstract idea exception. A representative Ferguson claim is:

> 1. A method of marketing a product, comprising:
>
> Developing a shared marketing force, said shared marketing force including at least marketing channels, which enable marketing a number of related products;
>
> Using said shared marketing force to market a plurality of different products that are made by a plurality of different autonomous producing company [sic], so that different autonomous companies, having different ownerships, respectively produce said related products;
>
> Obtaining a share of total profits from each of said plurality of different autonomous producing companies in return for said using; and
>
> Obtaining an exclusive right to market each of said plurality of products in return for said using.

The following guidance presents factors that are to be considered when evaluating patent-eligibility of method claims. The factors include inquiries from the machine-or-transformation test, which remains a useful investigative tool, and inquiries gleaned from Supreme Court precedent. While the Supreme Court in *Bilski* did not set forth detailed guidance, there are many factors to be considered when determining whether there is sufficient evidence to support a determination that a method claim is directed to an abstract idea. The following factors are intended to be useful examples and are not intended to be exclusive or limiting. It is recognized that new factors may be developed, particularly for emerging technologies. It is anticipated that the factors will be modified and changed to take into account developments in precedential case law and to accommodate prosecution issues that may arise in implementing this new practice.

Additional guidance in the form of expanded explanation and specific examples will follow in due course.

IV. *Evaluating Method Claims for Eligibility*: Where the claim is written in the form of a method and is potentially a patentable process, as defined in 35 U.S.C. 100(b), the claim is patent-eligible so long as it is not disqualified as one of the exceptions to § 101's broad patent-eligibility principles; *i.e.*, laws of nature, physical phenomena, and abstract ideas.

Taking into account the following factors, the examiner should determine whether the claimed invention, viewed as a whole, is disqualified as being a claim to an abstract idea. Relevant factors—both those in favor of patent-eligibility and those against such a finding—should be weighed in making the determination. Factors that weigh in favor of patent-eligibility satisfy the criteria of the machine-or-transformation test or provide evidence that the abstract idea has been practically applied. Factors that weigh against patent-eligibility neither satisfy the criteria of the machine-or-transformation test nor provide evidence that the abstract idea has been practically applied. Each case will present different factors, and it is likely that only some of the factors will be present in each application. It would be improper to make a conclusion based on one factor while ignoring other factors.

This additional guidance, which builds upon the *2009 Interim Instructions*, is a factor-based inquiry. Although the following approach is a change, it is anticipated that subject matter eligibility determinations will not increase in complexity, particularly for examiners who do not routinely encounter claims that implicate the abstract idea exception. Examiners will recognize that the machine-or-transformation test set forth in Section II(B) of the *2009 Interim Instructions*, although not the sole test for evaluating the subject matter eligibility of a method claim, is still pertinent in making determinations pursuant to the factors listed below. Examiners are referred to the summary sheet of factors provided at the end of this *Interim Bilski Guidance* which may be useful in determining subject matter eligibility of a method claim.

Factors To Be Considered in an Abstract Idea Determination of a Method Claim

A. Whether the method involves or is executed by a particular machine or apparatus. If so, the claims are less likely to be drawn to an abstract idea; if not, they are more likely to be so drawn. Where a machine or apparatus is recited or inherent in a patent claim, the following factors are relevant:

(1) The particularity or generality of the elements of the machine or apparatus; *i.e.*, the degree to which the machine in the claim can be specifically identified (not any and all machines). Incorporation of a particular machine or apparatus into the claimed method steps weighs toward eligibility.

(2) Whether the machine or apparatus implements the steps of the method. Integral use of a machine or apparatus to achieve performance of the method weighs toward eligibility, as compared to where the machine or apparatus is merely an object on which the method operates, which weighs against eligibility.

(3) Whether its involvement is extrasolution activity or a field-of-use, *i.e.*, the extent to which (or how) the machine or apparatus imposes meaningful limits on the execution of the claimed method steps. Use of a machine or apparatus that contributes only nominally or insignificantly to the execution of the claimed method (e.g., in a data gathering step or in a field-of-use limitation) would weigh against eligibility.

B. Whether performance of the claimed method results in or otherwise involves a transformation of a particular article. If such a transformation exists, the claims are less likely to be drawn to an abstract idea; if not, they are more likely to be so drawn. Where a transformation occurs, the following factors are relevant:

(1) The particularity or generality of the transformation. A more particular transformation would weigh in favor of eligibility.

(2) The degree to which the recited article is particular; i.e., can be specifically identified (not any

and all articles). A transformation applied to a generically recited article would weigh against eligibility.

(3) The nature of the transformation in terms of the type or extent of change in state or thing, for instance by having a different function or use, which would weigh toward eligibility, compared to merely having a different location, which would weigh against eligibility.

(4) The nature of the article transformed, *i.e.*, whether it is an object or substance, weighing toward eligibility, compared to a concept such as a contractual obligation or mental judgment, which would weigh against eligibility.

(5) Whether its involvement is extrasolution activity or a field-of-use, *i.e.*, the extent to which (or how) the transformation imposes meaningful limits on the execution of the claimed method steps. A transformation that contributes only nominally or insignificantly to the execution of the claimed method (e.g., in a data gathering step or in a field-of-use limitation) would weigh against eligibility.

C. Whether performance of the claimed method involves an application of a law of nature, even in the absence of a particular machine, apparatus, or transformation. If such an application exists, the claims are less likely to be drawn to an abstract idea; if not, they are more likely to be so drawn. Where such an application is present, the following factors are relevant:

(1) The particularity or generality of the application. Application of a law of nature having broad applicability across many fields of endeavor weighs against eligibility, such as where the claim generically recites an effect of the law of nature or claims every

mode of accomplishing that effect, such that the claim would monopolize a natural force or patent a scientific fact. (As an example, claiming "the use of electromagnetism for transmitting signals at a distance.")

(2) Whether the claimed method recites an application of a law of nature solely involving subjective determinations; *e.g.*, ways to think about the law of nature. Application of a law of nature to a particular way of thinking about, or reacting to, a law of nature would weigh against eligibility.

(3) Whether its involvement is extrasolution activity or a field-of-use, *i.e.*, the extent to which (or how) the application imposes meaningful limits on the execution of the claimed method steps. An application of the law of nature that contributes only nominally or insignificantly to the execution of the claimed method (e.g., in a data gathering step or in a field-of-use limitation) would weigh against eligibility.

D. Whether a general concept (which could also be recognized in such terms as a principle, theory, plan or scheme) is involved in executing the steps of the method. The presence of such a general concept can be a clue that the claim is drawn to an abstract idea. Where a general concept is present, the following factors are relevant:

(1) The extent to which use of the concept, as expressed in the method, would preempt its use in other fields; i.e., that the claim would effectively grant a monopoly over the concept.

(2) The extent to which the claim is so abstract and sweeping as to cover both known and unknown uses of the concept, and be performed through any existing or future-devised machinery, or even without any apparatus.

(3) The extent to which the claim would effectively cover all possible solutions to a particular problem; *i.e.*, that the claim is a statement of the problem versus a description of a particular solution to the problem.

(4) Whether the concept is disembodied or whether it is instantiated; *i.e.*, implemented, in some tangible way. Note, however, that limiting an abstract idea to one field of use or adding token postsolution components does not make the concept patentable. A concept that is well-instantiated weighs in favor of eligibility.

(5) The mechanism(s) by which the steps are implemented; e.g., whether the performance of the process is observable and verifiable rather than subjective or imperceptible. Steps that are observable and verifiable weigh in favor of eligibility.

(6) Examples of general concepts include, but are not limited to:

- Basic economic practices or theories (e.g., hedging, insurance, financial transactions, marketing);
- Basic legal theories (e.g., contracts, dispute resolution, rules of law);
- Mathematical concepts (e.g., algorithms, spatial relationships, geometry);
- Mental activity (e.g., forming a judgment, observation, evaluation, or opinion);
- Interpersonal interactions or relationships (e.g., conversing, dating);
- Teaching concepts (e.g., memorization, repetition);

- Human behavior (e.g., exercising, wearing clothing, following rules or instructions);

- Instructing "how business should be conducted," Bilski, slip op. at 12.

V. *Making the Determination of Eligibility*: Each of the factors relevant to the particular patent application should be weighed to determine whether the method is claiming an abstract idea by covering a general concept, or combination of concepts, or whether the method is limited to a particular practical application of the concept. The presence or absence of a single factor will not be determinative as the relevant factors need to be considered and weighed to make a proper determination as to whether the claim *as a whole* is drawn to an abstract idea such that the claim would effectively grant a monopoly over an abstract idea and be ineligible for patent protection.

If the factors indicate that the method claim is not merely covering an abstract idea, the claim is eligible for patent protection under § 101 and must be further evaluated for patentability under all of the statutory requirements, including utility and double patenting (§ 101); novelty (§ 102); non-obviousness (§ 103); and definiteness and adequate description, enablement, and best mode (§ 112). Section 101 is merely a coarse filter and thus a determination of eligibility under § 101 is only a threshold question for patentability. Sections 102, 103, and 112 are typically the primary tools for evaluating patentability unless the claim is truly abstract, *see, e.g.*, *Bilski*, slip op. at 12 ("[S]ome business method patents raise special problems in terms of vagueness and suspect validity.").

If the factors indicate that the method claim is attempting to cover an abstract idea, the examiner will reject the claim under § 101, providing clear rationale supporting the determination that an abstract idea has been claimed, such that the examiner establishes a *prima facie* case of patent-ineligibility. The conclusion made by the examiner must be based on the evidence as a whole. In making a rejection or if presenting reasons for allowance when appropriate, the examiner should specifically point out the factors that are relied upon in making the determination. If a claim is rejected under § 101 on the basis that it is drawn to an abstract idea, the applicant then has the opportunity to explain why the claimed method is not drawn to an abstract idea. Specifically identifying the factors used in the analysis will allow the applicant to make specific arguments in response to the rejection if the applicant believes that the conclusion that the claim is directed to an abstract idea is in error.

The *Interim Bilski Guidance* is for examination guidance in light of the recent decision in *Bilski*. This guidance does not constitute substantive rule making and hence does not have the force and effect of law. Rejections will continue to be based upon the substantive law, and it is these rejections that are appealable. Consequently, any perceived failure by Office personnel to follow this guidance is neither appealable nor petitionable.

The *Interim Bilski Guidance* merely updates USPTO examination practice for consistency with the USPTO's current understanding of the case law regarding patent subject matter eligibility under 35 U.S.C. 101 in light of *Bilski*. Therefore, the *Interim Bilski* Guidance relates only to interpretative rules, general statements of policy, or rules of agency organization, procedure, or practice. The USPTO is providing this opportunity for public comment because the USPTO desires the benefit of public comment on the *Interim Bilski Guidance*; however, notice and an opportunity for public comment are not required under 5 U.S.C. 553(b) or any other law. *See Cooper Techs. Co. v. Dudas*, 536 F.3d 1330, 1336-37, 87 U.S.P.Q.2d 1705, 1710 (Fed. Cir. 2008) (stating that 5 U.S.C. 553, and thus 35 U.S.C. 2(b)(2)(B), does not require notice and comment rule making for "'interpretative rules, general statements of policy, or rules of agency organization, procedure, or practice.'" (quoting 5 U.S.C. 553(b)(A))). Persons submitting written comments should note that the USPTO may not provide a "comment and response" analysis of such comments as notice and an opportunity for public comment are not required under 5 U.S.C. 553(b) or any other law.

Dated: July 4, 2010.

David J. Kappos,

Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.

Bilski Claims

1. A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:

(a) Initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumers;

(b) Identifying market participants for said commodity having a counter-risk position to said consumers; and

(c) Initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

2. The method of claim 1 wherein said commodity is energy and said market participants are transmission distributors.

3. The method of claim 2 wherein said consumption risk is a weather-related price risk.

4. The method of claim 3 wherein the fixed price for the consumer transaction is determined by the relationship:

$$\text{Fixed Bill Price} = F_i + [(C_i + T_i + LD_i) \times (\alpha + \beta E(W_i)]$$

wherein,

F_i = fixed costs in period i;

C_i = variable costs in period i;

T_i = variable long distance transportation costs in period i;

LD_i = variable local delivery costs in period i;

$E(W_i)$ = estimated location-specific weather indicator in period i; and α and β are constants.

5. The method of claim 4 wherein said location-specific weather indicator is at least one of heating degree days and cooling degree days.

6. The method of claim 4 wherein said energy provider seeks a swap receipt to cover the marginal weather-driven cost.

7. The method of claim 4 wherein the energy price is determined by the steps of:

(a) Evaluating the usage and all costs for a prospective transaction;

(b) Performing a Monte Carlo simulation across all transactions at all locations for a predetermined plurality of years of weather patterns and establishing the payoffs from each transaction under each historical weather pattern;

(c) Assuming that the summed payoffs are normally distributed;

(d) Performing one-tail tests to determine the marginal likelihood of losing money on the deal and the marginal likelihood of retaining at least the design margin included in the initial evaluation of the fixed bill price; and

(e) Adjusting the margin of the fixed bill price if the transaction as initially priced leads to a reduced expected margin or increases the likelihood of a loss until the expected portfolio margin and the likelihood of portfolio loss is acceptable.

8. The method of claim 4 wherein a cap on the weather-influenced pricing is established by the steps of:

(a) Evaluating the usage equation and all costs for a prospective transaction;

(b) Performing a Monte Carlo simulation across all transactions at all locations for a predetermined plurality of years of weather patterns and establishing the payoffs from each transaction under each historical weather pattern assuming that the price in the transaction being priced floats down when the weather is below normal;

(c) Assuming that the summed payoffs are normally distributed;

(d) Performing one-tail tests to determine the marginal likelihood of losing money on the transaction and the marginal likelihood of retaining at least the design margin included in the initial evaluation of the fixed price bill;

(e) Continuing to reprice the margin in the transaction until the expected portfolio margin and likelihood of portfolio loss is acceptable; and

(f) Establishing the margin as a call option on weather at a predetermined location.

9. The method of claim 1 wherein said commodity provider seeks a swap receipt to cover the price risk of the consumer transaction.

101 Method Eligibility Quick Reference Sheet

The factors below should be considered when analyzing the claim as a whole to evaluate whether a method claim is directed to an abstract idea. However, not every factor will be relevant to every claim and, as such, need not be considered in every analysis. When it is determined that the claim is patent-eligible, the analysis may be concluded. In those instances where patent-eligibility cannot easily be identified, every relevant factor should be carefully weighed before making a conclusion. Additionally, no factor is conclusive by itself, and the weight accorded each factor will vary based upon the facts of the application. These factors are not intended to be exclusive or exhaustive as there may be more pertinent factors depending on the particular technology of the claim. For assistance in applying these factors, please consult the accompanying "Interim Guidance" memo and TC management.

Factors Weighing Toward Eligibility

- Recitation of a machine or transformation (either express or inherent).
  - Machine or transformation is particular.
  - Machine or transformation meaningfully limits the execution of the steps.
  - Machine implements the claimed steps.
  - The article being transformed is particular.
  - The article undergoes a change in state or thing (*e.g.*, objectively different function or use).
  - The article being transformed is an object or substance.
- The claim is directed toward applying a law of nature.
  - Law of nature is practically applied.
  - The application of the law of nature meaningfully limits the execution of the steps.
- The claim is more than a mere statement of a concept.
  - The claim describes a particular solution to a problem to be solved.
  - The claim implements a concept in some tangible way.
  - The performance of the steps is observable and verifiable.

Factors Weighing Against Eligibility

- No recitation of a machine or transformation (either express or inherent).

- Insufficient recitation of a machine or transformation.

  - Involvement of machine, or transformation, with the steps is merely nominally, insignificantly, or tangentially related to the performance of the steps, e.g., data gathering, or merely recites a field in which the method is intended to be applied.

  - Machine is generically recited such that it covers any machine capable of performing the claimed step(s).

  - Machine is merely an object on which the method operates.

  - Transformation involves only a change in position or location of article.

  - "Article" is merely a general concept (see notes below).

- The claim is not directed to an application of a law of nature.

  - The claim would monopolize a natural force or patent a scientific fact; e.g., by claiming every mode of producing an effect of that law of nature.

  - Law of nature is applied in a merely subjective determination.

  - Law of nature is merely nominally, insignificantly, or tangentially related to the performance of the steps.

- The claim is a mere statement of a general concept (see notes below for examples).

  - Use of the concept, as expressed in the method, would effectively grant a monopoly over the concept.

  - Both known and unknown uses of the concept are covered, and can be performed through any existing or future-devised machinery, or even without any apparatus.

° The claim only states a problem to be solved.

° The general concept is disembodied.

° The mechanism(s) by which the steps are implemented is subjective or imperceptible.

Notes

(1) Examples of general concepts include, *but are not limited, to:*

- Basic economic practices or theories (*e.g.*, hedging, insurance, financial transactions, marketing);
- Basic legal theories (e.g., contracts, dispute resolution, rules of law);
- Mathematical concepts (*e.g.*, algorithms, spatial relationships, geometry);
- Mental activity (*e.g.*, forming a judgment, observation, evaluation, or opinion);
- Interpersonal interactions or relationships (*e.g.*, conversing, dating);
- Teaching concepts (*e.g.*, memorization, repetition);
- Human behavior (*e.g.*, exercising, wearing clothing, following rules or instructions);
- Instructing "how business should be conducted."

(2) For a detailed explanation of the terms machine, transformation, article, particular, extrasolution activity, and field-of-use, please refer to the Interim Patent Subject Matter Eligibility Examination Instructions of August 24, 2009.

(3) When making a subject matter eligibility determination, the relevant factors should be weighed with respect to the claim as a whole to evaluate whether the claim is patent-eligible or whether the abstract idea exception renders the claim ineligible. When it is determined that the claim is patent-eligible, the analysis may be concluded. In those instances where patent-eligibility cannot be easily identified, every relevant factor should be carefully weighed before making a conclusion. Not every factor will be relevant to every claim. While no factor is conclusive by itself, the weight accorded each factor will vary based upon the facts of the application. These factors are not intended to be exclusive or exhaustive as there may be more pertinent factors depending on the particular technology of the claim.

(4) Sample Form Paragraphs:

a. Based upon consideration of all of the relevant factors with respect to the claim as *a whole*, claim(s) [1] held to claim an abstract idea, and is therefore rejected as ineligible subject matter under 35 U.S.C. 101. The rationale for this finding is explained below: [2] 1. In bracket 2, identify the decisive factors weighing against patent-eligibility, and explain the manner in which these factors support a conclusion of ineligibility. The explanation needs to be sufficient to establish a prima facie case of ineligibility under 35 U.S.C. 101.

b. Dependent claim(s) [1] when analyzed as a whole are held to be ineligible subject matter and are rejected under 35 U.S.C. 101 because the additional recited limitation(s) fail(s) to establish that the claim is not directed to an abstract idea, as detailed below: [2] 1. In bracket 2, provide an explanation as to why the claim is directed to an abstract idea; for instance, that the additional limitations are no more than a field of use or merely involve insignificant extrasolution activity; *e.g.*, data gathering. The explanation needs to be sufficient to establish a prima facie case of ineligibility under 35 U.S.C. 101.

[FR Doc. 2010-18424 Filed 7-26-10; 8:45 am]

BILLING CODE 3510-16-P

EXHIBIT 6

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

[Filed 09/22/10]

Docket No. CA 07-974

CLS Bank International,
Plaintiff,

vs.

Alice Corporation Pty, Ltd.
Defendant.

Washington, D.C.
Friday, August 6, 2010
10:20 a.m.

TRANSCRIPT OF STATUS CONFERENCE BEFORE THE HONORABLE ROSEMARY M. COLLYER UNITED STATES DISTRICT JUDGE

APPEARANCES:

For the Plaintiff:

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For the Defendant:

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Court Reporter:

CRYSTAL M. PILGRIM, RPR
United States District Court
District of Columbia
333 Constitution Avenue, NW
Room 4700-F
Washington, DC 20001

Proceedings recorded by machine shorthand, transcript produced by computer-aided transcription.

[2] THE DEPUTY CLERK: Civil action 07-974, CLS Bank International versus Alice Corporation.

For the plaintiff Steven Glassman and William Tanenbaum. For defense Bruce Genderson, David Krinsky and Stanley Fisher.

THE COURT: Good morning everyone. Nice to see you again.

Now that the Supreme Court has totally cleared this matter up. I assume that you've reached a settlement because it's all exceptionally clear in your minds as to what the standard is.

I mean, I'm really glad that they could have at least remanded to the Federal Circuit and made the Federal Circuit struggle again so that we could just not have to do it here, but I guess we're going to have to do it here.

How would you like to proceed? Do you think we should do more briefs? Explain to me the luminosity of the Bilski decision.

MR. GLASSMAN: Should I speak first?

THE COURT: Whichever, both of you can come forward. We're not battling at the moment.

MR. GLASSMAN: We have spoken, Your Honor and—

THE COURT: I assumed that you would have.

MR. GLASSMAN: Nice to see Your Honor again.
THE COURT: Nice to see you too.

MR. GLASSMAN: Unfortunately, it's been a little [3] longer than we expected.

THE COURT: But we got such an answer that we're all golden, right?

MR. GENDERSON: Your Honor, we all had exactly the same reaction.

THE COURT: I mean, really it's, you know, one on my law clerks was saying isn't it their job. If they don't like that standard then to tell us what the standard is? It comes back to 94 different district courts. I mean any way, go on, sorry.

MR. GLASSMAN: Your Honor, on behalf of CLS obviously we have waited a long time for the Supreme Court and of course we've all read the multiplicity of decisions and we started counting justices for this and justices for that with the concurrences and all of that.

But I think our view is that despite the fact that the Supreme Court did not give us new guidance that one might have looked for, that fundamentally despite waiting so much time that the law as to what is patentable subject matter is more or less not that much changed from where it was before the Supreme Court's decision I mean in a nutshell. We still have the principal that abstract ideas, mental processes are not patentable. The question is how you define that and although the machine transformation test that was set forth is the sole test by the Federal Circuit is viewed as not the sole test, it [4] remains apparently the only test that is left as being at least identified as being viable, or a clue, or the best clue depending upon which opinion we look at.

Our view is that we should renew the briefing on it. We believe that the Alice patent claims are in fact drawn to unpatentable subject matter. We believe that before our view hasn't changed as a result of the Supreme Court decision, and so we would like to have the opportunity to brief it, rebrief it.

Our feeling, and I discussed this with counsel for Alice, was that we understand it's been a passage of time here and we don't want to prolong the agony on this one and we'd like to be able to brief it fairly expeditiously. We sort of think that while there will be differences from the earlier briefing, frankly they will—

THE COURT: They will be recognizable.

MR. GLASSMAN:— they will be fairly recognizable.

THE COURT: Right. We can't have, I can't really decide it thoroughly on the older briefs because Bilski isn't discussed at all.

MR. GLASSMAN: Right.

THE COURT: Since you are the patent mavens and I'm just the District Court Judge, I really want your input. I don't expect you to entirely agree, but I really want your input as to what you think Bilski does mean or what I'm suppose [5] to do with it, so I think re-briefing it is a very fine idea.

MR. GLASSMAN: Also, just in terms of the schedule what, and we discussed this with Mr. Genderson and his team, we, I think with Your Honor's permission we'd like to meet briefly afterwards to try to agree on a schedule.

But what we had in the interest of trying to expedite it is between our main brief and their opposition, then they'll cross move, then we have reply and they get one so we do have a multiplicity of briefs. We had proposed a schedule that would get all of the briefing done by the end of September.

Alice's counsel has some scheduling issues with some other cases. It looks like we could reach an agreement that if not the end of September would go to the middle of October, but we'd work that, we hadn't worked out the exact dates, but that's what we were thinking of when we met briefly before the Court this morning. If that's acceptable to Your Honor we could do that.

THE COURT: Yes, that's acceptable to me.

MR. GENDERSON: Your Honor, we've had—

THE COURT: Yes.

MR. GENDERSON: We obviously disagree with Mr. Glassman's assessment of the merits of this issue. I'm not going to get into them too much.

THE COURT: Well, I assumed that.

MR. GENDERSON: But I do think that as to two of the [6] four patents that deal with system claims rather than method claims the argument that Mr. Glassman's client had made in the briefing was that the machine was not particular enough, and I do think the one thing that the Supreme Court has done has made it clear is that that's no longer an argument.

So it's our view that while we think all four patents will survive this, the two of them I don't even think there's an issue anymore under Bilski, and that our system claims do survive.

We have been, it's been now three years since this suit was filed. Originally, Your Honor, the preliminary motion in discovery was contemplated to be on the question of whether jurisdictionally there were acts within the United States.

They said well, we want to file Bilski too after that was decided, and we said fine. This has now delayed things beyond anyone's expectation I think.

Because the documents discovery is going to be fairly extensive here and won't interfere with the briefing, we would like to ask Your Honor to at least allow document discovery to begin so that we're not another year from now and still not having taken depositions. Because given the documents are going to be in Europe, our client is in Australia, there may be even some third party discovery we're going to need.

I think that it makes a lot of sense to start that process now and to work out a schedule assuming that something [7] is left after Bilski.

MR. GLASSMAN: Can I respond to that, Your Honor?

THE COURT: Yes, just let me ask a question first. In order to do even document discovery, will you need a protective order? Or we have one that's already in place?

MR. GENDERSON: We have one in place.

THE COURT: You do. I didn't look back on the docket long enough to see that it was there.

MR. GENDERSON: And I'm lucky that my memory is good enough, but yes, I had to pause, there is one in place because we did some preliminary document discovery.

THE COURT: Okay.

MR. GENDERSON: One other point, Your Honor, you have signed the order so that you are aware that Alice was issued another patent.

THE COURT: Right.

MR. GENDERSON: I just want to make it clear to you that there's no dispute among us that the rulings that you have already granted as to the then existing patents would also apply here. There's no, I don't think there's any assertion we have got to go back and redo it as to that. We just wanted this in the case so that we could brief Bilski in connection with this patent as well.

THE COURT: That was my understanding. So that's why we have four.

[8] MR. GENDERSON: Correct.

THE COURT: Is the new one a system or a method?

MR. GENDERSON: It's a system.

THE COURT: It's a system.

MR. GENDERSON: And it's somewhat more particular to the issues that we think help us, they're going to disagree and that's why we have a lawsuit.

THE COURT: Isn't that wonderful. And that's why I have a job. This is really great, we're all in agreement. Okay. What do you think about document discovery?

MR. GLASSMAN: As to the new patent, we have consented to agree to this part of the case.

It's based on the same disclosures, patent specification as the others, so it's a continuation application.

So I agree, it really doesn't change the complexion of the case. There's some nuances in the claims.

THE COURT: Okay.

MR. GLASSMAN: On briefing Bilski we would just brief it altogether so as not to prolong it—

THE COURT: Right.

MR. GLASSMAN: — any further.

In terms of Mr. Genderson's comment about possibly having discovery and whether Bilski has a potential for essentially riding us of the entire case as opposed to part of the case, we do disagree. 1 don't think that the Supreme Court [9] said anything of the kind on system claims as opposed to method claims. I just disagree on what he said on that.

And in indeed while this would be covered in the briefing, if anything, what the Supreme Court did in our view was essentially it harkened back to it's prior decision, you know, Benson case and the Flook case and the Diehr case. And in our view those cases actually have language that basically says the question of whether something is patentable subject matter should not depend upon the draftsman's opinion as to whether you take a method or you recharacterize it as a system or what you do with it. Essentially it's really the concept of, you know, is the underlying patent — is the underlying invention drawn to patentable subject matter or is it more a mental process and abstract thing. Because you draft, clearly a good draftsman can take a method and say well, put the method on a computer.

So we believe actually that the Supreme Court decision to that extent actually improve our position, but that's the disagreement. So we actually believe that the result will be that the, all of the patents are, should be invalid as not having patentable subject matter.

But as to the question of discovery, document discovery proceeding at the same time, our view is that we really shouldn't do that especially if we brief this quickly because first we agree there will be substantial document discovery if [10] we have to go forward and it's expensive and it's time consuming and unfortunately, we wish we were nine months back with the same position but that wasn't our fault and the clients will be burdened with cost which we think will be needless.

The other point that Your Honor may consider in that light is that while we think all of the patent claims are vulnerable under this patentability issue, even if we were wrong and if Your Honor should end up deciding well, the method claims, the method patents those are not patentable subject matter but somehow the system claims survive, if that were the case, then that result would seriously impact the scope of discovery.

And the reason for that is that the method patents were issued earlier in 1999 I believe and in 2005, 2005 where the system claims were not until, made until 2006 and now we have one in 2010.

The result is that the scope of discovery depending on which patents, if any, would be left in the case would be seriously impacted in terms of what CLS did and when certainly damage discovery if we ever got to that stage, heaven forbid, would be seriously impacted.

So we think that the more practical, logical thing to do at this point would be to let us brief this quickly and see where we land, and either the case will be over or part of it [11] will be over and we'll be able to structure, if that's the case, we can structure a more realistic discovery schedule.

MR. GENDERSON: Your Honor, we're the defendants in this case, they brought the case three years ago. It seems to me that under these circumstances it's not uncommon for people to file summary judgment motions in the course of discovery and that normally doesn't mean discovery ends.

We believe we have been damaged. We believe there's a continuing damage and we'd like to have this case move forward. They didn't have to bring the case, but when they, for them to complain that there's going to be discovery when they're the plaintiffs and brought the case, seems to me not to be correct and we're not asking —

THE COURT: What do you say about the point that the systems claims are much newer than the method claims and so the discovery if we just opened up all discovery, that the discovery on the method claims would be quite lengthy and expensive much more than the system claims?

MR. GENDERSON: I think that's probably only true as to damage discovery which I would have no problem if we limited the discovery initially to non-damage discovery for example and then once the, because we think the non-system claims will survive, and then we can strike that in, hopefully in a few months.

But we would like to get started and it's going to take, [12] it's going to be a fairly lengthy process I think to do the document discovery.

In addition, Your Honor, and this is an argument that we made in the early briefs, it's our view that the method claims are patentable and that you can decide that on the papers now, but we also think that if we're wrong about that, the decision as to the method claims may well depend on claim construction.

So what we argued in the initial papers and I think we're going to argue again is that even if you disagree with our arguments, you shouldn't throw out the method claims now because if you construe the claims in a certain way those claims are going to survive even if our legal arguments are wrong.

So I think there's a reasonable chance here even as to those claims that we're not going to be able to resolve it until we do Markman further down the road anyway, and that's another reason why we think we should start with fact discovery.

MR. GLASSMAN: Your Honor, if I may briefly say as to the, the discovery point. We disagree on the substantive point and we'll be briefing that.

I will say even as to Markman our briefing will assume a broad construction favorable to Alice, so we're going to assume that in arguing whether this is really a patentable subject matter or not so that we can expedite that.

[13] But as to the discovery point, I'm not sure that we will resolve this right here, but we believe that in our experience at least in dealing with patent cases the question of the date of discovery that the earlier date is not limited to damages discovery because if we put on damage discovery, that would be easy. But typically people, the patentee will ask for discovery at least from the time of patent issuance as to just what, how the accused infringer developed their system. You know, not just what they actually do now, but how they developed it, whether it was similar or not similar to what the patent said, whether it was copying, whether these kinds of issues.

So if they were in agreement that we don't go back to any discovery before the date of the system patents; i.e. December 2006, I believe, then we would have a shorter updating of discovery which could make, I suppose could make some sense. But I have a feeling we're not going to get agreement that in fact that earlier discovery of many years of how CLS developed and what actually happened that that's not relevant. If we have an agreement on that, we could in fact have a shorter and less extensive round of discovery in the entire case.

MR. GENDERSON: Your Honor, we believe, I'm not going to be a surprise to you, that how they developed their system relevant even as to the patent just issued last month.

So we think all that is going to be relevant to the [14] systems claims anyway and that we're entitled to that discovery and it's not going to be, their development information I don't think is going to be nearly as burdensome and it's a fairly confined set of information as opposed to the damage discovery.

THE COURT: All right. Why don't we do this.

Why don't you get together and propose dates certain for the briefing, and then propose dates certain for document discovery that won't begin until after the briefing is over so that you're not doing two things at once and you're not running up huge bills for your clients at the same time of briefing.

Then I'll be able to look at your opening briefs and your proposal for discovery when all of the briefs are done and then I'll have some sense as to how long it's going to take me to decide this. I mean, if it's going to take me some months to reach a decision on the Bilski points, then I think that I should let you start discovery. If I'm going to be able to decide that more immediately, then maybe I'll have you hold off until I get it decided.

But obviously if, if the Bilski arguments or the unpatentability arguments really, are the winners that CLS hopes they are, right or wrong, if I agree with them we'll save everybody a lot of money and you can immediately go to the Federal Circuit and be the first one there to say here's a stupid Federal Judge who did the wrong thing, see. Then you'll make names for yourself and lights and I will be back here [15] working in the vineyard.

But anyway, let's do it that way, okay. Come up with dates first for the briefing, and then for discovery and we'll assume that that's what's going to happen unless I call off discovery after I've looked at the briefs and I think I can actually decide it fast enough.

MR. GLASSMAN: We'll talk the document discovery dates.

THE COURT: Document discovery dates, right. Let's not do depositions yet, but you can get stared on document discovery, okay.

Does that make sense to you?

MR. GENDERSON: That makes sense, Your Honor.

We'll send you something Monday.

THE COURT: That's fine.

MR. GENDERSON: In terms of argument, I assume you're going to want to have argument and just—

THE COURT: I assume that we're going to have to have argument.

MR. GENDERSON: Mr. Krinsky who was planning to argue this last time and I think will argue it this time and I have a trial in November, so I just—

THE COURT: We'll do it in November.

MR. GENDERSON: We'll make that clear in the papers that we send.

[16] THE COURT: We won't do it in November because I will need at least that much time myself to get smart enough on it.

It's not useful for you to come argue if I haven't spent a good deal of time so that I know what you are arguing about and I can ask at least the questions that I want to ask even if they're not as intelligent as you hope. But it doesn't waste your time to come and argue before I have really gotten into it. So November won't be a problem.

MR. GENDERSON: Thank you.

MR. GLASSMAN: Thank you, Your Honor.

We'll try to make the briefing as direct as we can. We won't—

THE COURT: Yes, short declarative sentences.

MR. GLASSMAN: I think we can do that.

THE COURT: In a patent case, can you imagine that, wow. Okay.

MR. GLASSMAN: Thank you, Your Honor.

MR. GENDERSON: Thank you.

THE COURT: Thank you very much. Thank you.

(Hearing concluded at 10:40 a.m.)

EXHIBIT 7

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O Box 1450
Alexandria, Virginia 22313-1450
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NOTICE OF ALLOWANCE AND FEE(S) DUE

EXAMINER: SNAPP, SANDRA S
ART UNIT: 3624
PAPER NUMBER
DATE MAILED: 10/05/2004

26111 7590 10/05/2004
STERNE, KESSLER, GOLDSTEIN & FOX PLLC
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

APPLICATION NO. 09/567,507
FILING DATE 05/09/2000
FIRST NAMED INVENTOR Ian Kenneth Shepherd
ATTORNEY DOCKET NO. 1033.0170002
CONFIRMATION NO. 6891

TITLE OF INVENTION: METHODS AND APPARATUS RELATING TO THE FORMULATION AND TRADING OF RISK MANAGEMENT CONTRACTS

APPLN. TYPE	nonprovisional
SMALL ENTITY	NO
ISSUE FEE	$1370
PUBLICATION FEE	$0
TOTAL FEE(S) DUE	$1370
DATE DUE	01/05/2005

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW, TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B -Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and ½ the ISSUE FEE shown above.

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IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail

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Alexandria, Virginia 22313-1450
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26111 7590 10/05/2004
STERNE, KESSLER, GOLDSTEIN & FOX PLLC
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

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(Depositor's name)

(Signature)

(Hate)

APPLICATION NO.	09/567,507
FILING DATE	05/09/2000
FIRST NAMED INVENTOR	Ian Kenneth Shepherd
ATTORNEY DOCKET NO.	1033.0170002
CONFIRMATION NO.	6891

TITLE OF INVENTION: METHODS AND APPARATUS RELATING TO THE FORMULATION AND TRADING OF RISK MANAGEMENT CONTRACTS

APPLN. TYPE	nonprovisional
SMALL ENTITY	NO
ISSUE FEE	$1370
PUBLICATION FEE	$0
TOTAL FEE(S) DUE	$1370
DATE DUE	01/05/2005

EXAMINER	SNAPP, SANDRA S
ART UNIT	3624
CLASS-SUBCLASS	705-037000

1. Change of correspondence address or indication of "Fee Address" (37CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/I122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required,

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,	1________
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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

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Please check the appropriate assignee category or categories (will not be printed on the patent)

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☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

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UNITED STATES PATENT AND
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EXAMINER SNAPP, SANDRA S
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26111 7590 10/05/2004
STERNE, KESSLER, GOLDSTEIN & FOX PLLC
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

Determination of Patent Term Extension under 35 U.S.C. 154(b)

(application filed after June 7, 1995 but
prior to May 29, 2000)

The patent Term Extension is 0 day(s). any patent to issue from the above-identified application will include an indication of the 0 day extension on the front page.

If a continued Prosecution Application (CPA) was filed in the above-identified application, the filling date that determines Patent Term Extension is the filing date of the most recent CPA.

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Effective October 1, 2004, 37 CFR 1.18 is amended by revising paragraphs (a) through (c) to read as set forth below.

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EXHIBIT 8

INTERIM EXAMINATION INSTRUCTIONS FOR EVALUATING SUBJECT MATTER ELIGIBILITY UNDER 35 U.S.C. §101

Andrew Hirshfeld, Acting DCPEP
Caroline Dennison, Michael Cygan, Nicole Dretar, and
Pinchus Laufer, OPLA
Marjorie Moran, Robert Weinhardt, Brian Werner, Tom Hughes,
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August 2009
United States Patent and Trademark Office

IMPLEMENTATION PLAN

- OVERVIEW OF INTERIM EXAMINATION INSTRUCTIONS FOR SUBJECT MATTER ELIGIBLITY
- INSTRUCTIONS WILL BE POSTED ON USPTO INTERNET WEBSITE
- TC SPECIFIC TRAINING TO FOLLOW
- QUESTIONS SHOULD BE DIRECTED TO SPEs, THEN TO TC 101 REPRESENTATIVES

OVERVIEW

TRAINING OVERVIEW:

- THE TWO-STEP 101 ANALYSIS
- PRODUCT FLOWCHART AND EXAMPLES
- PROCESS FLOWCHART AND EXAMPLES

STEP 1

- Is the claim directed to one of the four patent-eligible subject matter categories?
  - Process, Machine, Manufacture, Composition of Matter

- If not in one of the four categories, the claim is not eligible.
  - Examples of claims that are not eligible:
    - Transitory signals *per se*, humans *per se*, a company *per se*, or a set of instructions *per se* (such as a game or software *per se)*

STEP 2

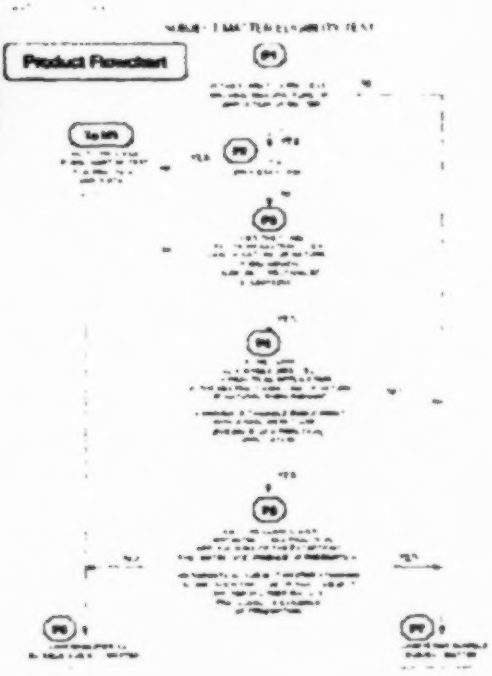
- A claim satisfying Step 1 is subject-matter eligible under 101 unless it wholly embraces a judicially recognized exception.
- Does the claim wholly embrace a judicially recognized exception?
  - Abstract Idea
  - Law of Nature
  - Natural Phenomena
  - The exceptions also include, for example
    - Mental Processes
    - Mathematical Algorithms
    - Scientific Principles

➢ **If the claim is directed to a judicial exception itself, it is not eligible.**

➢ **A particular practical application of a judicial exception is eligible.**

PRODUCT CLAIM ANALYSIS

- Begin with the broadest reasonable interpretation (BRI) of the claim in view of the specification consistent with the interpretation those skilled in the art would reach. MPEP 2111
- Product Focus:
  - Does the claim meet definitions of machine, manufacture or composition of matter?
  - Is there a judicial exception recited in the claim?



PRODUCT EXAMPLE: CLAIM 1
No Judicial Exception

Claim 1. A hand tool, comprising:

- a handle; and
- a head coupled to the handle having a striking surface and a claw.

- Is the claim directed to a machine or manufacture? (P1)
  - YES - it is an article produced from prepared materials.
- Does it recite a judicial exception? (P3)
  - NO.

➢ The claim is **eligible** (P6).

PRODUCT EXAMPLE: CLAIM 2
Judicial Exception Claimed

Claim 2. A machine for evaluating search results, comprising:

- a microprocessor coupled to a memory,
  wherein the microprocessor is programmed to evaluate search results by:
    - sorting the results into groups based on a first characteristic;
    - ranking the results based on a second characteristic using a mathematical formula [f]; and
    - comparing the ranked results to a predetermined list of desired results to evaluate the success of the search.

- Is the claim directed to a machine? (P1)
  - YES - it is a concrete thing, consisting of parts
- Does it recite a judicial exception? (P3)
  - YES - the ranking step includes a mathematical algorithm.
- Is it directed to a practical application? (P4)
  YES - evidenced by the tangible embodiment of the microprocessor for evaluating search results, which is a real world use.
- Is the claim directed to substantially all practical applications of the mathematical algorithm? (P5)
  - NO – the algorithm is limited to use in evaluating search results in the particular claimed machine that is programmed to perform certain steps. As there are other ways to use the algorithm, for example, with different programmed steps, not every use is covered by the claim.

➢ The claim is eligible (P6).

PRODUCT EXAMPLE: CLAIM 3
Computer-Readable Medium

Claim 3. A non-transitory computer-readable storage medium with an executable program stored thereon, wherein the program instructs a microprocessor to perform the following steps:

- sorting results of a search into groups based on a first characteristic;
- ranking the results based on a second characteristic using a mathematical formula [f]; and
- comparing the ranked results to a predetermined list of desired results to evaluate the success of the search.

- Is the claim directed to a manufacture? (P1)
  - YES - it is an article (a non-transitory storage medium) produced from raw or prepared materials.
- Does it recite a judicial exception? (P3)
  - YES - it recites a mathematical algorithm.
- Is it directed to a practical application? (P4)
  - YES - evidenced by the tangible embodiment of the computer-readable storage medium.
- Is the claim directed to substantially all practical applications of the mathematical algorithm? (P5)
  - NO – there are other substantial uses of the algorithm than using it in evaluating search results in a program stored on the particular claimed manufacture. As there are other ways to use the algorithm, for example, with different programmed steps, not every use is covered by the claim.

➢ The claim is eligible (P6).

COMPUTER-READABLE MEDIA
Additional Information

- The functional/non-functional distinction is not an inquiry under 101. The 101 inquiry is whether a claim directed to one of the four statutory categories is wholly directed to a judicial exception.

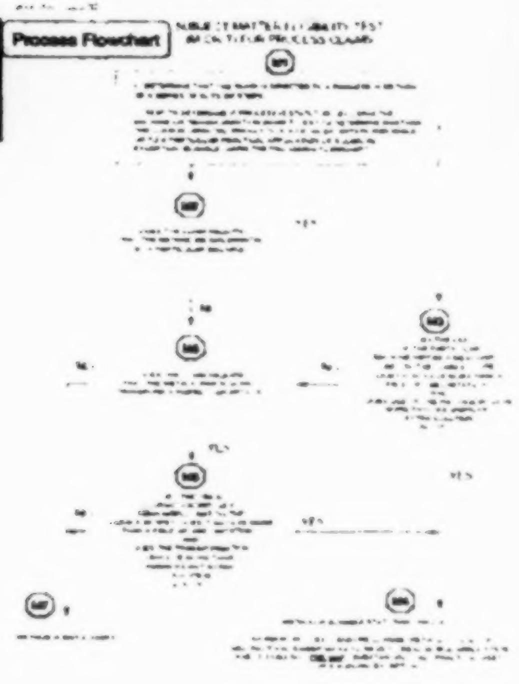
- A tangible medium including a computer program should be evaluated to determine if there is a functional relationship between the computer program and the medium for purposes of distinguishing *over prior art*, not for subject matter eligibility.

PROCESS CLAIM ANALYSIS

- Begin with the broadest reasonable interpretation (BRI) of the claim in view of the specification consistent with the interpretation those skilled in the art would reach. MPEP 2111.

- Process Focus:
  - Does the claim meet the machine or transformation (M-or-T) test? The claimed process must:
    - (1) be tied to a particular machine or apparatus, or
    - (2) particularly transform a particular article to a different state or thing.

    - Two corollaries: the particular machine or transformation must involve:
      - Meaningful limits
      - More than insignificant "extra-solution" activity



Process Flowchart

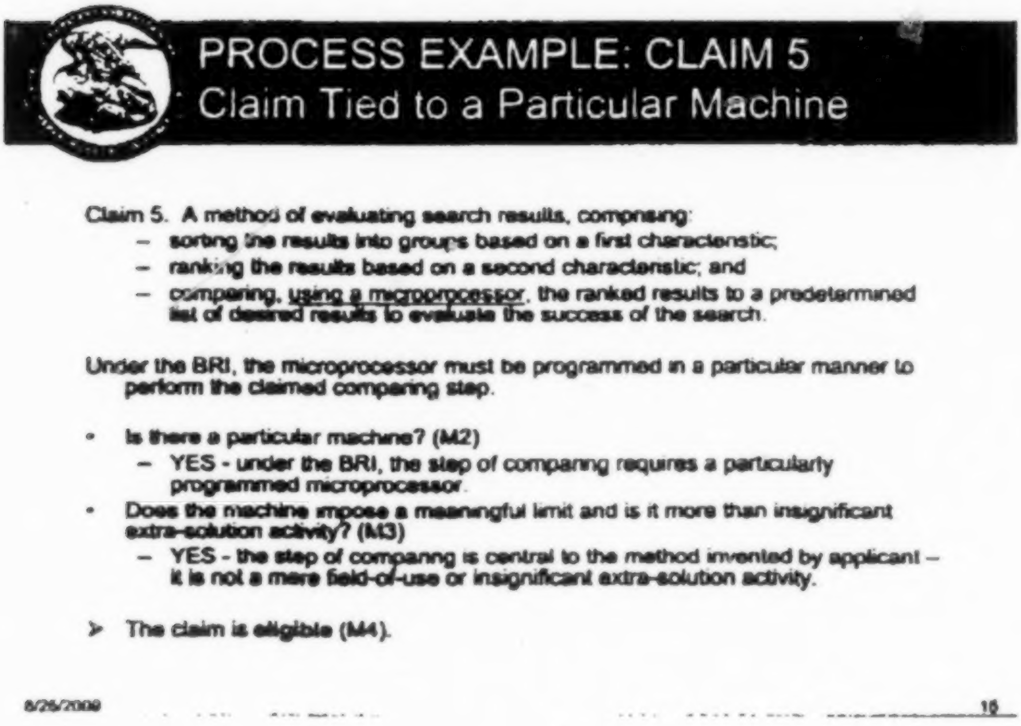
PROCESS EXAMPLE: CLAIM 4
No Machine or Transformation Claimed

Claim 4. A method of evaluating search results, comprising:
- sorting the results into groups based on a first characteristic;
- ranking the results based on a second characteristic; and
- comparing the ranked results to a predetermined list of desired results to evaluate the success of the search.

Under the BRI, each step could be done by hand or on a programmed computer.

- Is there a particular machine? (M2)
  - NO - there is no machine explicitly recited or inherently required
- Is there a transformation of an article? (M5) - NO

➢ Claim is not eligible (M7).



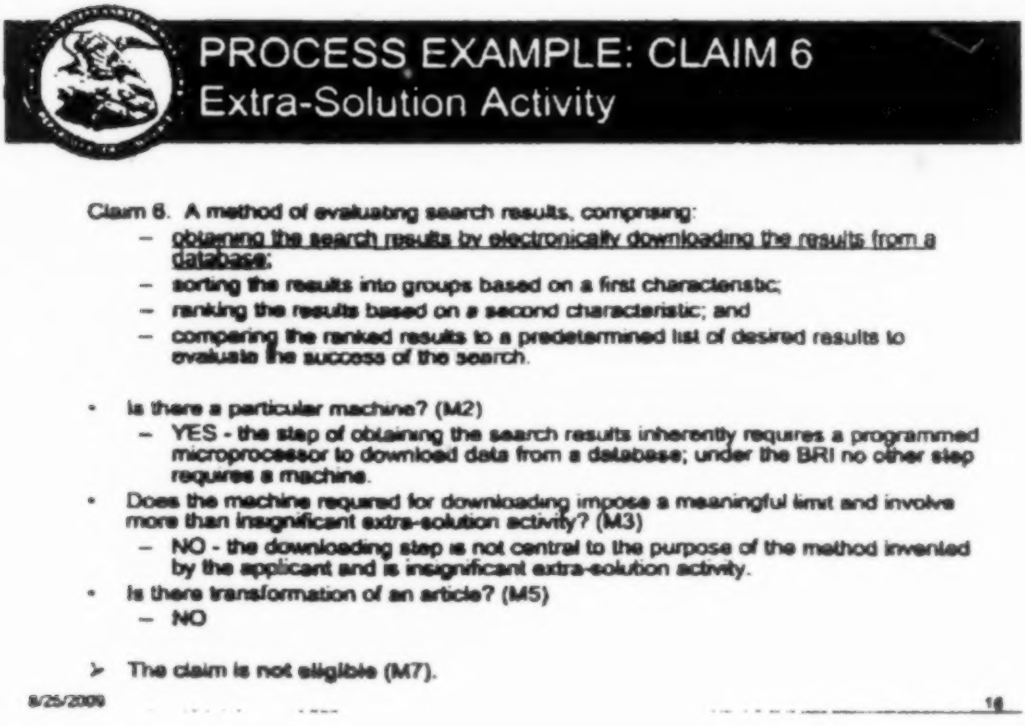
PROCESS EXAMPLE: CLAIM 5
Claim Tied to a Particular Machine

Claim 5. A method of evaluating search results, comprising:
- sorting the results into groups based on a first characteristic;
- ranking the results based on a second characteristic; and
- comparing, using a microprocessor, the ranked results to a predetermined list of desired results to evaluate the success of the search.

Under the BRI, the microprocessor must be programmed in a particular manner to perform the claimed comparing step.

- Is there a particular machine? (M2)
  - YES - under the BRI, the step of comparing requires a particularly programmed microprocessor.
- Does the machine impose a meaningful limit and is it more than insignificant extra-solution activity? (M3)
  - YES - the step of comparing is central to the method invented by applicant – it is not a mere field-of-use or insignificant extra-solution activity.

➢ The claim is eligible (M4).



PROCESS EXAMPLE: CLAIM 6
Extra-Solution Activity

Claim 6. A method of evaluating search results, comprising:
- obtaining the search results by electronically downloading the results from a database;
- sorting the results into groups based on a first characteristic;
- ranking the results based on a second characteristic; and
- comparing the ranked results to a predetermined list of desired results to evaluate the success of the search.

- Is there a particular machine? (M2)
  - YES - the step of obtaining the search results inherently requires a programmed microprocessor to download data from a database; under the BRI no other step requires a machine.
- Does the machine required for downloading impose a meaningful limit and involve more than insignificant extra-solution activity? (M3)
  - NO - the downloading step is not central to the purpose of the method invented by the applicant and is insignificant extra-solution activity.
- Is there transformation of an article? (M5)
  - NO

➢ The claim is not eligible (M7).

SUMMARY

- The Instructions supersede previous guidance on subject matter eligibility that conflicts with the Instructions, including MPEP 2106(IV), 2106.01 and 2106.02, as of 8/24/09.
  - To determine subject matter eligibility, follow the "Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101".
- Product claims are evaluated to determine if the claim is wholly directed to a judicial exception.
  - Functional/nonfunctional descriptive material (FDM/NFDM) is evaluated for patentable distinction over the prior art. See MPEP 2112.01(III).
- All process (method) claims are evaluated with the M-or-T test.

QUESTIONS

- TC SPECIFIC TRAINING WITH ADDITIONAL EXAMPLES WILL FOLLOW
- QUESTIONS SHOULD BE DIRECTED TO YOUR SPE, THEN TO THE FOLLOWING EMAIL HELP PANELS:
  - TC 1600: 101 Help-TC1600
  - TC 1700: 101 Help-TC1700
  - TC 3600: 101 Help-TC3600
  - TC 3700: 101 Help-TC3700
  - TC 2100: 101 Help-TC2100
  - TC 2400: 101 Help-TC 2400
  - TC 2600: 101 Help-TC2600
  - TC 2800: 101 Help-TC2800

THANK YOU

- The time code is ATRAIN-0000-090148.

PETITIONER'S BRIEF

RECORD [illegible]

Supreme Court, U.S.
FILED
JAN 21 2014
OFFICE OF THE CLERK

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

**On Writ of Certiorari
to the United States Court of Appeals
for the Federal Circuit**

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QUESTION PRESENTED

Whether claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

PARTIES TO THE PROCEEDING

All parties to the proceeding are identified in the caption.

RULE 29.6 STATEMENT

The sole parent corporation or publicly held company that owns 10 percent or more of the stock of Petitioner Alice Corporation Pty. Ltd. is National Australia Bank Limited.

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OPINIONS BELOW

The district court's opinion is reproduced in the appendix to the petition (Pet. App.) at 172a-238a, and reported at 768 F. Supp. 2d 221. The Federal Circuit panel decision is reproduced at Pet. App. 132a-71a, and reported at 685 F.3d 1341. The order granting rehearing en banc is reproduced at Pet. App. 239a-41a, and is available at 484 F. App'x 559. The opinions of the Judges of the Federal Circuit sitting en banc are reproduced at Pet. App. 1a-131a, and reported at 717 F.3d 1269.

JURISDICTION

The en banc court entered judgment on May 10, 2013. Pet. App. 1a. On July 22, 2013, the Chief Justice granted petitioner Alice Corporation Pty. Ltd. ("Alice") an extension of time to and including September 6, 2013, within which to file a petition for a writ of certiorari. A timely petition was filed on September 4, 2013, and granted on December 6, 2013. This Court has jurisdiction under 28 U.S.C. § 1254(1).

STATUTORY PROVISION INVOLVED

Section 101 of the Patent Act provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101.

STATEMENT OF THE CASE

A. Statutory and Case Law Background

"[A]ny new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof," is eligible for a patent.

35 U.S.C. § 101. Claims involving patent-eligible subject matter fall into two general categories: claims that cover products and claims that cover methods. See 1 Donald S. Chisum, *Chisum on Patents* § 1.02 (2013). Product claims relate to tangible items—*i.e.*, in the terms of § 101, "machine[s], manufacture[s], or composition[s] of matter." *Id.* Claims to machines are often called "system" or "apparatus" claims. Unlike product claims, "method" claims (also known, in the terms of § 101, as "process" claims) do not claim tangible matter, but instead recite a series of steps that produce a useful result. See *id.* § 1.03.

This Court has identified "three specific exceptions to § 101's broad patent-eligibility principles: 'laws of nature, physical phenomena, and abstract ideas.'" *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3225 (2010). The "abstract ideas" exception provided the basis for the decision in this case.

Subject matter that fits within the scope of § 101 is merely *eligible* for a patent—not necessarily entitled to patent protection. Even a patent-eligible claim will not be granted, and if granted will be held "invalid," unless it satisfies additional Patent Act requirements.

Sections 102 and 103 establish the novelty or inventiveness requirement. If a claim covers what already has been done or disclosed, it is "anticipated," and invalid for lack of novelty. See 35 U.S.C. § 102. And if a claim covers obvious modifications to what previously has been done or disclosed, it is invalid for "obviousness." *Id.* § 103; see *KSR Int'l Co.* v. *Teleflex, Inc.*, 550 U.S. 398, 417-18 (2007). As Judge Rich, one of the drafters of the 1952 Patent Act, explained: "[a]chieving the ultimate goal of a patent ... involves, to use an analogy, having the separate keys to open in succession the three doors of sections 101, 102, and

103." *Application of Bergy*, 596 F.2d 952, 960 (C.C.P.A. 1979), *vacated as moot*, *Diamond* v. *Chakrabarty*, 444 U.S. 1028 (1980). Section 101 "deal[s] with the question of kind, as distinguished from the qualitative conditions which make the invention patentable," and is "broad and general." *Id.* Sections 102 and 103 "guard[ ] the public interest by assuring that patents are not granted which would take from the public that which it already enjoys (matters already within its knowledge whether in actual use or not) or potentially enjoys by reason of obviousness from knowledge which it already has." *Id.* Only if an inventor "holds the three different keys to the three doors" does the invention "qualif[y] for a patent." *Id.* at 962.

Even if the inventor holds these "keys," however, no valid patent can issue unless the inventor "meet[s] still other statutory requirements in the preparation and prosecution of his patent application." *Id.* In particular, under § 112, the applicant must provide the public disclosures that are "'the quid pro quo of the right to exclude.'" *J.E.M. Ag Supply, Inc.* v. *Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 142 (2001) (quoting *Kewanee Oil Co.* v. *Bicron Corp.*, 416 U.S. 470, 484 (1974)). Thus, patent specifications must describe the invention sufficiently to permit one of ordinary skill in the art to implement the full scope of what is claimed without undue experimentation; otherwise, the claim is invalid for lack of enablement. 35 U.S.C. § 112(a). Similarly, the specification must provide a "written description" that establishes that the inventor actually had possession of what he or she has claimed. See *Ariad Pharm., Inc.* v. *Eli Lilly & Co.*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc). And, claims must "particularly point[ ] out and distinctly claim[ ] the subject matter which the inventor or joint inventor regards as the invention." 35 U.S.C. § 112(b). To assess whether a claim satisfies this "definiteness" requirement, the claim language is examined to determine whether it conveys to one of ordinary skill in the relevant field the precise boundaries of the claimed invention. *Permutit Co.* v. *Graver Corp.*, 284 U.S. 52, 60 (1931). These independent disclosure requirements ensure that the scope of the rights a patent confers on an inventor correspond to, and are limited to, what the inventor actually has contributed to the public.

B. Alice's Inventions

Ian Shepherd, Alice's founder, devised computer-performed operations that reduce "settlement risk"—a risk associated with transactions involving currencies and financial instruments. These transactions are typically structured to require the parties to exchange different assets at a future date. For example, if an investor expects the value of the dollar to rise relative to the yen, and another investor expects the opposite, they might agree to trade a predetermined number of dollars for a predetermined number of yen at some time in the future. One risk associated with such transactions is that only one side will perform the exchange. The exchange is known as "settlement," and so the risk of one-sided performance is referred to as "settlement risk."

Mr. Shepherd invented, and subsequently patented, computer systems, computerized methods, and computer products (*i.e.*, computer media) to eliminate this settlement risk for electronically executed transactions involving electronically traded currencies and instruments. The claims recite an electronic intermediary "supervisory institution" that facilitates settlement between the parties to an executory transaction. The patents disclose "automated infrastructure," JA249, that maintains "shadow accounts"—a "shadow credit record" and "shadow debit record"—which correspond to, but are maintained independently from, the parties' "real-world" bank accounts. See Pet. App. 71a-72a.[1] At the start of each "day" (the time between when the contract is formed and when it is settled), the shadow accounts are set to reflect the balances of the corresponding real-world accounts. *E.g.*, JA384. Throughout the "day," as the parties enter into additional transactions that create additional exchange obligations, the shadow accounts are adjusted on a "real-time basis," JA296, to reflect those additional obligations—but the supervisory institution allows only those transactions that will not cause the value reflected in the shadow credit record to exceed that in the shadow debit record. JA384. When it comes time for settlement, the automated system issues irrevocable instructions to the parties' "real-world" banks to make the required transfers, and settlement occurs. Because the system ensures that the parties incur only exchange obligations that they will be able to settle, settlement risk is eliminated.

Mr. Shepherd applied for and received four patents on his invention: U.S. Patent Nos. 5,970,479; 6,912,510; 7,149,720; and 7,725,375.[2] These patents, which were assigned to Alice, include system, method, and media claims.

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[1] These "shadow accounts" are sometimes referred to in the patents as "first" and "third" accounts. The bank accounts are sometimes referred to as "second" and "fourth" accounts.

[2] The '720, '510, and '375 patents are continuations or continuations-in-part of the '479 patent.

1. System Claims

The system claims disclose the computer system that Mr. Shepherd invented, and include all claims of the '720 patent, and claims 1 through 38 and 42 through 47 of the '375 patent. Claim 26 of the '375 patent is representative:

> A data processing system to enable the exchange of an obligation between parties, the system comprising:
>
> a communications controller,
>
> a first party device, coupled to said communications controller,
>
> a data storage unit having stored therein
>
> (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and
>
> (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and
>
> a computer, coupled to said data storage unit and said communications controller, that is configured to
>
> (a) receive a transaction from said first party device via said communications controller;
>
> (b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have

> adequate value in said first account and/or said third account, respectively; and
>
> (c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

JA1259-61. The claim thus recites a computer and other hardware, as well as the structural configuration of that hardware, specifically programmed to solve, in a particular way, the complex problem of settlement risk to which the invention is directed.

The computer in claim 26 is configured to receive transactions from the parties to an exchange, to make adjustments electronically to the shadow accounts independently maintained by the computer after ensuring that those accounts reflect "adequate value," and to generate instructions to the exchange institutions to implement the exchange in the separate real-world accounts maintained by those institutions. *Id.* The common specification that underlies all of the patents, including the '375 patent, contains flowcharts that provide algorithm support for the specific programming required to implement the operations recited in the claims. *E.g.*, JA1023, 1031-35.

2. Method Claims

The method claims are claims 33 and 34 of the '479 patent, and all claims of the '510 patent. Claim 33 of the '479 patent is representative:

> A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:
>
> > (a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
> >
> > (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;
> >
> > (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and
> >
> > (d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant

> obligations placed on the exchange institutions.

JA383-84.

The claimed computer-implemented method involves electronically creating shadow accounts; making adjustments to the shadow accounts, in chronological order, to reflect those exchange obligations that will not impede settlement; and irrevocably ordering settlement at the end of the period. There is no dispute that the method claims require the use of a computer. Pet. App. 28a. The specification makes clear that the claimed method uses an "automated infrastructure," JA249, that works on a "real-time basis," JA296, to implement irrevocable financial exchanges. The record confirms that a person of skill in the art would understand the methods, as claimed, to require use of a computer. See JA128 ¶ 26 (explaining that "the methods claimed" would be understood to require electronic implementation "using some type of computer processor and memory"); JA124 ¶ 17 ("the terms 'shadow credit record' and 'shadow debit record'" would be understood "to require the electronic storage of data files in a data storage unit.").

Of course, despite claiming a computer-implemented method, and despite containing in their specifications a detailed discussion and multiple diagrams regarding how to implement the claimed inventions, Alice's patents are not limited to precise strings of computer code. In this regard, Alice's patents are no different from the vast majority of patents on computer-implemented inventions. Claims to computer-implemented inventions are written this way out of necessity. Were it otherwise—if software patents claimed only specific code—it would be both difficult for patent examiners and the public to interpret their scope, and trivial to evade the patents and practice their inventions by making inconsequential alterations to that code or simply using a different computer language. The U.S. Patent and Trademark Office recognizes this, and encourages patentees "to functionally define the steps the computer will perform rather than simply reciting source or object code instructions." *Examination Guidelines for Computer-Related Inventions*, 61 Fed. Reg. 7478, 7486 (Feb. 28, 1996) ("*Examination Guidelines*"). Moreover, this form of disclosure is sufficient to enable software inventions: "[w]riting computer programming code for software to perform specific functions is normally within the skill of the art once those functions have been adequately disclosed." *Manual of Patent Examining Procedure* § 2161.01(I), at 2100-178 (rev. Aug. 2012).

3. Media Claims

Media claims are claims "to a computer readable medium (e.g., a disk, hard drive, or other data storage device) containing program instructions for a computer to perform a particular process." *Cyber-Source Corp.* v. *Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011). Alice's media claims are claims 39 through 41 of the '375 patent. They each claim a "computer program product comprising a computer readable storage medium," *i.e.*, a physical structure, "having computer readable program code embodied in the medium" that computers use to operate the systems and implement the methods outlined above. JA1262-63.

C. CLS

Respondents CLS Bank International and CLS Services Ltd. ("CLS") provide a settlement service designed to eliminate settlement risk. D.D.C. Dkt. 51

Ex. 39, at 3. Its "members" maintain multi-currency accounts with the bank. Fed. Cir. J.A. 91. When members agree to a future exchange, CLS "receives and processes instructions, carries out the steps in the settlement process, and issues [i]nstructions to effect payouts" to the appropriate member accounts. *Id.* The entire process is computer-implemented. *Id.* (describing CLS's service as "implemented in computer hardware and software").

"The impetus behind the creation of CLS came from regulatory concerns regarding the potential for [foreign-exchange] settlement risk to be a major source of systemic risk ...." *About Us*, http://www.cls-group.com/About/Pages/default.aspx (last visited Jan. 17, 2014). Publications like *The Economist* reported CLS's formation in 2002—almost ten years after Mr. Shepherd filed his first patent application and three years after it was granted—as a significant new development, claiming that it would "change the relationship that banks have with their biggest customers and with each other." *Plumbing Revolution*, The Economist (Nov. 14, 2002), *available at* http://www.economist.com/node/1441975. IBM, which partnered with CLS to create its complex technological infrastructure, described CLS's mission as requiring CLS "to radically rethink the way [foreign-exchange] markets work." *CLS transforms worldwide foreign exchange trading with IBM* (2006), http://tinyurl.com/pvznu3z. CLS itself has described its service as "chang[ing] the way the financial services industry operates." D.D.C. Dkt. 51, Ex. 19, at 1. In short, CLS's service—like the systems, methods, and media claimed in Alice's patents—involves using computer technology in a particular way to eliminate settlement risk for electronically effected transactions.

D. Procedural History

1. District Court Proceedings

CLS filed a complaint on May 25, 2007 seeking a declaratory judgment of non-infringement, invalidity, and unenforceability of the '479, '510, and '720 patents. Alice filed counterclaims for infringement of all three patents. After the '375 patent issued in May 2010, both parties amended their filings to include this patent.

Following this Court's decision in *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010), Alice and CLS filed cross-motions for summary judgment as to the eligibility of the asserted claims. The district court held every asserted claim invalid as directed to ineligible subject matter. Pet. App. 172a. "At the heart of these claims," according to the court, was

> the fundamental idea of employing a neutral intermediary to ensure that parties to an exchange can honor a proposed transaction, to consummate the exchange simultaneously to minimize the risk that one party does not gain the fruits of the exchange, and then irrevocably to direct the parties, or their value holders, to adjust their accounts or records to reflect the concluded transaction.

Id. at 214a. This, the court reasoned, was an abstract idea not eligible for patent protection. *Id.*; see also *id.* at 235a.

2. Proceedings Before The Federal Circuit Panel

A panel of the Federal Circuit reversed. In an opinion by Judge Linn, joined by Judge O'Malley, the court recognized the breadth of the eligible subject matter defined by § 101, see, *e.g.*, Pet. App. 142a, and noted that exceptions to this broad grant "should arise infrequently," *id.* at 143a. The court held, in light of the specific claim limitations in Alice's patents, that the claims covered "the practical application of a business concept in a specific way," *id.* at 159a, and therefore easily satisfied the subject-matter requirements of § 101. Judge Prost, who characterized the claims as covering only the "literally ancient" idea of using "an intermediary in a financial transaction," dissented. *Id.* at 163a.

3. Proceedings Before The En Banc Federal Circuit

The Federal Circuit granted CLS's petition for en banc rehearing, Pet. App. 240a, but was unable to issue any majority opinion. Seven of the ten judges voted to affirm the district court's decision that the method and media claims were not directed to eligible subject matter, but there was no majority as to the reasoning. As for the system claims, there was no majority as to reasoning or result, and the judgment was affirmed by an equally divided court.

Writing for the plurality, Judge Lourie set forth a multi-step test for assessing subject-matter eligibility. Under this approach, after determining whether the claimed invention "fits within one of the four statutory classes," Pet. App. 20a, courts should ask "whether the claim" at issue "raises § 101 abstractness concerns at all." *Id.* The next step is to look past the claim's language "to identify and define whatever fundamental concept appears wrapped up in the claim." *Id.* Courts then look to the "balance of the claim" to determine whether it contains "additional substantive limitations that narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself." *Id.* at 20a-21a. Applying this test to

Alice's method claims, the plurality found they were drawn to "the abstract idea of reducing settlement risk by effecting trades through a third-party intermediary (here, the supervisory institution) empowered to verify that both parties can fulfill their obligations before allowing the exchange." *Id.* at 28a. And having established that this was the abstract idea "wrapped up" in the method claims, the plurality concluded that the claim limitations, including the computer-implementation requirements, were insufficient to render those claims eligible. *Id.* at 31a. The system and media claims were said to be invalid on similar grounds.

The court produced five other opinions. Chief Judge Rader wrote a partial-concurrence, joined in full by Judge Moore, and in part by Judges Linn and O'Malley. Pet. App. 41a. This opinion emphasized that, contrary to the plurality's approach, claims must be considered "*as a whole*," *id.* at 54a, not stripped of limitations until "something that could be characterized as an abstract idea" reveals itself. *Id.* Chief Judge Rader concluded, and all three judges who joined his opinion agreed, that reviewed as a whole, Alice's system claims were patent-eligible: They covered "the use of a computer and other hardware specifically programmed to solve a complex problem"; the specification disclosed multiple figures providing "detailed algorithms for the software with which the hardware is to be programmed"; and the system claims were not co-extensive with the abstract idea of using a financial intermediary, but rather involved one particular application of financial intermediation. *Id.* at 73a. However, in a part of his opinion joined only by Judge Moore, Chief Judge Rader concluded that the media and method claims were invalid as abstract ideas. *Id.* at 82a.

Judge Moore penned a partial dissent, joined by Chief Judge Rader and Judges Linn and O'Malley, Pet. App. 85a, which criticized the plurality's approach of "stripping away all known elements from the asserted system claims and analyzing only whether what remains, as opposed to the claim as a whole, is an abstract idea." *Id.* at 90a. This, she said, was "inconsistent with the 1952 Patent Act, and years of Supreme Court, CCPA, and Federal Circuit precedent that abolished the 'heart of the invention' analysis for patentability." *Id.*

Judge Newman filed a dissent, Pet. App. 99a, arguing that the proper approach is to "return to the statute, and hold that when the subject matter is within the statutory classes in section 101, eligibility is established." *Id.* at 111a. She would have held all of the claims eligible. *Id.* at 113a.

In a separate dissent, Pet. App. 113a, Judges Linn and O'Malley wrote that because all of the claims were "grounded by the same meaningful limitations," *id.*, the method and media claims were directed to patent-eligible subject matter for the same reasons Chief Judge Rader gave with respect to the system claims.

Finally, Chief Judge Rader filed "[a]dditional reflections," Pet. App. 126a, in which he expressed disappointment that the question of subject-matter eligibility had departed so greatly from the text of § 101. *Id.* at 129a.

SUMMARY OF ARGUMENT

The deep and multiple splits in the Federal Circuit's en banc ruling illustrate the confusion in the lower courts regarding the patent eligibility of computer-implemented inventions. As shown by the divergent opinions in this case, that confusion largely stems from uncertainty over how to determine whether a claim to a computer-implemented invention runs afoul of the judicial exception for "abstract ideas."

Resolving that uncertainty requires answering three questions: (1) What is an "abstract idea"? (2) What is the proper analysis for determining whether a claim recites an abstract idea? And (3) if a claim does recite an abstract idea, what is the proper analysis for determining whether the claim simply defines the abstract idea itself, in which case it is ineligible under § 101, or whether the claim defines an invention that is an application—specifically, a computer-implemented application—of the idea? The answers to each of these questions can be found in this Court's case law on the abstract ideas exception.

First, the Court has explained that the abstract ideas exception applies only to those preexisting fundamental truths, such as mathematical formulas, that are "equivalent" to a law of nature and that "exist[ ] in principle apart from any human action." *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1297-98 (2012). The purpose of the abstract ideas exception, like the other exceptions this Court has identified, is to avoid foreclosure of the "basic tools of scientific and technological work." *Gottschalk* v. *Benson*, 409 U.S. 63, 67 (1972). Thus, the abstract ideas exception does not extend to any and all disembodied concepts, but only to fundamental truths—*i.e.*, "mathematical formulas and the like," *Mayo*, 132 S. Ct. at 1303. The Court reaffirmed this understanding of abstract ideas in *Bilski*, 130 S. Ct. at 3225, and held ineligible a claim to a "'fundamental economic practice'" that had been "reduced to a mathematical formula," *id.* at 3231.

Indeed, this is the only understanding of the abstract ideas exception that is "consistent with" and does not "deviate from" the statutory text. *Id.* at 3225-26.

Second, assessing whether a claim recites an abstract idea requires reviewing claim language as it is written and in its totality. Because patent claims granted by the U.S. Patent and Trademark Office have legal significance, in that they inform both the patentee and the public of the boundaries of the patent grant, claim language may not be modified or dissected by a reviewing court. See *Diamond* v. *Diehr*, 450 U.S. 175, 188-89, 193 n.15 (1981). Nor should courts consider the novelty of individual limitations—or the claim as a whole—when applying § 101, because this erodes both the claims' critical notice function and the purpose of other patentability criteria.

Third, a claim directed to one of § 101's four statutory categories that does not, on its face, recite a fundamental truth is patent-eligible. Patent claims that require a computer—both process claims that require use of a computer and machine claims that include a computer—are drawn to statutory subject matter. Thus, so long as such claims do not recite a fundamental truth, they are patent-eligible. Where a claim does recite a fundamental truth, such as a mathematical formula, and uses a computer to *apply* that formula in a specific way to achieve a useful result, the claim is also patent-eligible. *Diehr*, 450 U.S. at 187. But where the claim recites a mathematical formula and simply uses a computer to perform the formula's mathematical operations, the claim is ineligible. See *Parker* v. *Flook*, 437 U.S. 584, 594-95 (1978). In the latter case, the claim would effectively preempt the use of the formula—a "basic tool" free for all to use, *Benson*, 409 U.S. at 67—in an array of possible applications that the patentee did not invent.

Application of these principles confirms that Alice's claims recite eligible subject matter. Each claim is directed to one of § 101's four categories. And the claims' language, on its face, does not recite any fundamental truth. The plurality concluded otherwise only by improperly paraphrasing and dissecting the claim language to conclude that the claims are drawn to a supposed abstract idea of using third-party intermediation to reduce settlement risk. But the supposed abstract idea does not appear in the claim language—and the plurality's analysis ignores the limitations that *do* appear in the claims. Moreover, even if Alice's claims could somehow be read as directed to an abstract idea, they do not preempt all use of any such idea. To the contrary, the specific claim limitations—including in particular the limitations calling for a particular form of computer implementation—preclude any conclusion that the invention as claimed is directed to an idea in itself. The claims do not foreclose the use of any abstract idea, but instead prescribe one particular way of reducing a particular kind of settlement risk by using a computer in a particular way.

Clarifying the three principles described here will advance not only this litigation, but also patent litigation, patent examination, and technological innovation nationwide. The confusion surrounding both abstract ideas and the proper way to analyze claim language in assessing the abstract ideas exception has imposed substantial costs on the patent system and its participants. Those costs accrue disproportionately in connection with computer-implemented inventions, which are routinely perceived (often incorrectly) to recite abstract ideas.

Further explicating the principles this Court has already established for the application of § 101—not creating new rules for computer-implemented inventions—will alleviate this problem. Indeed, should any computer-specific rule be warranted, it is the role of Congress—not the courts—to provide it.

ARGUMENT

I. COMPUTER-IMPLEMENTED INVENTIONS RARELY FIT WITHIN THE NARROW SCOPE OF THE "ABSTRACT IDEAS" EXCEPTION AS DEFINED BY THIS COURT.

A. The Judicial Exception For "Abstract Ideas" Extends Only To Preexisting, Fundamental Truths Equivalent To A Law Of Nature.

1. The Judicial Exceptions To § 101 Are Narrow And Were Created To Implement The Statute's Purpose Of Awarding Patents Only To Products Of Human Ingenuity.

Section 101 of the Patent Act defines the subject matter that is eligible to be patented:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101. This Court has made clear that the scope of § 101 is broad: "In choosing such expansive terms ... modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope." *Diamond* v. *Chakrabarty*,

447 U.S. 303, 308 (1980). "Congress took this permissive approach to patent eligibility to ensure that '"ingenuity should receive a liberal encouragement."' *Bilski*, 130 S. Ct. at 3225 (quoting *Chakrabarty*, 447 U.S. at 308-09).

This Court has also made clear, however, that "§ 101's broad patent-eligibility principles" are subject to specific judicially created exceptions: '"[L]aws of nature, physical phenomena, and abstract ideas,"' even if newly discovered, are not eligible for a patent. *Id.* Accordingly, even if an invention appears to fit within one of the four statutory categories of eligible subject matter, a claim to subject matter within one of the three exceptions is nonetheless ineligible. See, *e.g.*, *Mayo*, 132 S. Ct. at 1294. These exceptions originated in the Court's case law more than a century ago, *e.g.*, *Le Roy* v. *Tatham*, 55 U.S. (14 How.) 156, 175 (1852); *O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62, 112-21 (1853), and have been repeatedly reaffirmed in the decades since, *e.g.*, *Mayo*, 132 S. Ct. at 1293; *Bilski*, 130 S. Ct. at 3225; *Diehr*, 450 U.S. at 185.

The first two exceptions—laws of nature and physical phenomena—have created little interpretive difficulty. These exceptions follow plainly from the statutory text, in that § 101 requires that a patent-eligible invention be "new"—*i.e.*, not preexisting, as a law of nature or physical phenomenon is. See *Bilski*, 130 S. Ct. at 3225 (these exceptions are "consistent with the notion that a patentable process must be 'new and useful'"); *Ass'n for Molecular Pathology* v. *Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013) ("Products of nature are not created, and manifestations ... of nature [are] free to all men and reserved exclusively to none") (internal quotation marks omitted); *Mayo*, 132 S. Ct. at 1297 (law of nature "exists in principle apart from any human action").

By contrast, the connection between the third exception, for abstract ideas, and the statutory text is less apparent. Perhaps for this reason, the scope of the exception has been the source of considerable confusion. Mark A. Lemley et al., *Life After* Bilski, 63 Stan. L. Rev. 1315, 1316 (2011) ("Put simply, the problem is that no one understands what makes an idea 'abstract.'"); Pet. App. 145a ("The abstractness of the 'abstract ideas' test to patent eligibility has become a serious problem ...."). This confusion is largely responsible for the disarray in § 101 jurisprudence, particularly as it relates to computer-implemented inventions.

2. This Court's Cases Have Limited The "Abstract Ideas" Exception, Consistent With The Statute, To Patents That Claim Preexisting, Fundamental Truths.

The problem may stem from the fact that the term "abstract ideas" is ambiguous. One possible meaning is the literal, dictionary definition: "abstract," meaning "[c]onsidered apart from concrete existence," and "idea," meaning "[s]omething, such as a thought or conception, that potentially or actually exists in the mind as a product of mental activity." *The American Heritage Dictionary of the English Language* 8, 870 (4th ed. 2001). An abstract idea in this sense is simply a thought divorced from any physical object or activity or any practical application; a pure mental conception. As explained below, a claim defining such an abstraction presents no difficulty under § 101—it is simply not one of the four categories of inventions authorized for patenting under § 101.

That is not, however, the meaning this Court has applied in discussing the abstract ideas exception to patent eligibility. Instead, this Court has used the term as a synonym for a fundamental truth—a preexisting concept analogous to a law of nature, such as, for example, a mathematical formula or relationship. See, *e.g.*, *Diehr*, 450 U.S. at 185. In explaining why "abstract ideas" are, as a category, ineligible for patenting, the Court has explained that they are substantively the same as a law of nature, and thus not "new" within the meaning of § 101. *Mayo*, 132 S. Ct. at 1298 ("abstract ideas" within the scope of the judicial exception are those that are "the equivalent of natural laws"). A fundamental truth in the sense of a mathematical formula "reveals a relationship that has always existed," whereas "'[p]atentable subject matter must be new ... not merely heretofore unknown.'" *Flook*, 437 U.S. at 593 n.15. Thus, like a law of nature, an "abstract idea," as the Court has used the term, is "'part of the storehouse of knowledge of all men ... free to all men and reserved exclusively to none.'" *Bilski*, 130 S. Ct. at 3225 (quoting *Funk Bros. Seed* v. *Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)), and one of the "basic tools of scientific and technological work," *Benson*, 409 U.S. at 67, that belongs to the public.

For these reasons, an abstract idea in the fundamental truth sense cannot be made the property of any individual—even one who is the first to discover its existence or recognize its value. When a patent claim recites such an abstract idea, it can be patented only if the claim includes other elements or steps that go beyond the fundamental truth itself, thus limiting the claimed invention to a specific application and preserving public access to the fundamental truth. See *Diehr*, 450 U.S. at 188

("Arrhenius' equation is not patentable in isolation, but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by § 101."); ***Flook***, 437 U.S. at 594. Nor is it enough simply to claim the use of a fundamental truth in a particular field; such a field-of-use limitation cannot change the fact that what has been claimed is still a preexisting, fundamental truth. No one is entitled to the exclusive use of such a principle, as such, in any field, no matter how narrow. A fundamental truth, like a law of nature, belongs to the public, for use in any and every field, and no one can prevent the public from using it—even one who first recognizes its utility in a particular field.

This Court's § 101 cases make clear that it is only this form of "abstract idea"—a preexisting, fundamental truth, *i.e.*, "mathematical formulas and the like," *Mayo*, 132 S. Ct. at 1303—that is one of the three judicially crafted exceptions that bars patenting of products and processes that § 101 otherwise declares eligible for patenting. For example, in *Diehr*, the Court assessed a process for curing rubber using a mathematical formula (the Arrhenius equation) and a programmed computer. The claimed process was patent-eligible because, although it "admittedly employ[ed] a well-known mathematical equation," the inventors did "not seek to pre-empt the use of that equation. Rather, they [sought] only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process," including "installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time." 450 U.S. at 187. Throughout the analysis, the Court explicitly equated "abstract ideas" with the notion of a mathematical "algorithm," which the Court defined as a "procedure for solving a given type of mathematical problem," *id.* at 186—not with generic, disembodied concepts or any other kind of "abstract idea." See *id.* at 191-92 ("We recognize, of course, that when a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract.").

Similarly, in both *Flook* and *Benson*, the Court applied the abstract ideas exception to mathematical algorithms. In *Flook*, the Court considered a claimed process for computing an updated "alarm limit" value by measuring the alarm limit, then calculating a new alarm limit using a mathematical formula, then adjusting the alarm limit based on the calculation. 437 U.S. at 596-97. The Court acknowledged that the claimed method was limited to a certain field (catalytic conversion of hydrocarbons) and called for "'post-solution' activity" (adjusting the alarm limit to reflect the calculations), *id.* at 590, but nonetheless held it ineligible because to grant a patent would foreclose "one of the 'basic tools of scientific and technological work.'" *Id.* at 591-92. In *Benson*, the Court held ineligible a method for using a computer to implement a mathematical algorithm to convert binary-coded decimal numerals into pure binary numerals because "the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." 409 U.S. at 71-72. And in both cases, the Court treated the "abstract ideas" exception as directed to such fundamental truths, not simply pure concepts. See *Flook*, 437 U.S. at 589 (explaining that *Benson* "[r]eason[ed] that an algorithm, or mathematical formula, is like a law of nature ... [and] a law of nature cannot be the subject of a patent."); *id.* at 595 n.18 ("[O]ur holding today is that a claim for an improved method of calculation ... is unpatentable subject matter under § 101."); *Benson*, 409 U.S. at 71-72 (declaring ineligible a claim that "would wholly pre-empt the mathematical formula").

Most recently, in *Bilski*, the Court again held ineligible as an "abstract idea" a patent claim directed to a fundamental truth. The key claims at issue in *Bilski* described "a series of steps instructing how to hedge risk" (claim 1) and that series of steps "articulated ... into a simple mathematical formula" (claim 4). 130 S. Ct. at 3223-24. Claim 1 recited:

> "(a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumers;
>
> "(b) identifying market participants for said commodity having a counter-risk position to said consumers; and
>
> "(c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions."

Id. at 3223-24. Thus, step (a) described a provider entering into contracts to sell a commodity to consumers at some fixed price, step (b) described the provider finding someone who wants to supply the commodity, and step (c) described the supplier selling the commodity to the provider at a fixed price designed to "'balance[ ] the risk'" of the step (a) transaction. *Id.* at 3224. Claim 1 therefore was directed simply to a fundamental or mathematical truth: risk from one fixed price transaction can be avoided by engaging in an offsetting fixed price transaction. That the claimed invention was nothing more than such a fundamental truth is evident given that, as this Court emphasized, the steps of claim 1 were "put[ ] ... into a simple mathematical formula" in claim 4. *Id.* at 3223, 3231. The character of the claims, which involved no computer implementation or other use of physical instrumentalities, led the Court to conclude that "[t]he concept of hedging, described in claim 1 and reduced to a mathematical formula in claim 4, is an unpatentable abstract idea, *just like the algorithms at issue in* Benson *and* Flook." *Id.* at 3231 (emphasis added). And the Court explained that its rationale for declaring the claims ineligible was to permit continued public access to the "'fundamental economic practice'" the applicants had claimed: "Allowing petitioners to patent risk hedging would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea." *Id.*; see also *id.* at 3227 (plurality) (describing "the larger object" of the patent law to be "securing patents for valuable inventions without transgressing the public domain").

Thus, in each of these cases, the Court applied the "abstract ideas" exception solely to fundamental or mathematical truths, which, whether known or unknown, "exist[ ] in principle apart from any human action," *Mayo*, 132 S. Ct. at 1297; see also *Flook*, 437 U.S. at 593 n.15 (abstract ideas "reveal[ ] a relationship that has always existed"). Indeed, it is only with this understanding of "abstract ideas" that the abstract ideas exception can be reconciled with the text of § 101, and with the Court's stated rationale for creating exceptions to that statutory text. See *Bilski*, 130 S. Ct. at 3225-26 (explaining that the three judicial exceptions "are consistent with" the text of § 101 and rejecting a construction under which "the Patent Act's terms deviate from their ordinary meaning"). Fundamental, preexisting truths are not "new" within the meaning of § 101, and are therefore properly deemed an "exception[ ] to § 101's broad patent-eligibility principles." *Id.* at 3225.

3. The "Abstract Ideas" Exception Does Not Extend To All Disembodied Concepts.

Confusion persists, however, because the term "abstract ideas" can also be understood to mean a disembodied concept or pure mental conception. A claim to this form of "abstract idea," standing alone, would also be ineligible under § 101—but for a very different reason. A disembodied concept, standing alone, does not fall within any of the four statutory categories. That is, a pure concept, with no practical application, is not a machine, manufacture, or composition of matter, nor is it a process, understood as an ordered series of steps to produce a practical result. See *Rubber-Tip Pencil Co.* v. *Howard*, 87 U.S. (20 Wall.) 498, 507 (1874) ("An idea of itself is not patentable").

The rationale this Court has articulated for the abstract ideas *exception* has no role to play in finding disembodied "abstract ideas" ineligible for patenting. That is because it cannot be said that each and every mental conception is a "basic tool[ ] of scientific and technological work," *Benson*, 409 U.S. at 67, that is "equivalent" to a law of nature like E = mc^2 or the law of gravity, *Mayo*, 132 S. Ct. at 1293, 1298. Moreover, a disembodied concept is not necessarily preexisting, and may well be "new" within the meaning of § 101. See, *e.g.*, *United States* v. *Dubilier Condenser Corp.*, 289 U.S. 178, 188 (1933) (describing "an inventive act" as "the birth of an idea and its reduction to practice"); *Richmond Screw Anchor Co.* v. *United States*, 275 U.S. 331, 339 (1928) (patentee "developed a new idea").

It also would make little sense to craft an abstract ideas "exception" to subject-matter eligibility for disembodied concepts. Such abstractions, standing alone, are *already* excluded by the plain language of § 101, which limits patents to four defined types of inventions. And the fact that a claim directed to one of the four statutory categories incorporates, in some fashion, a disembodied concept is entirely *un*exceptional. Every invention can be portrayed in conceptual terms, and every inventor begins the inventive process with an "abstract idea" in this sense. See *Dubilier Condenser Corp.*, 289 U.S. at 188; cf. *Bonito Boats, Inc.* v. *Thunder Craft Boats, Inc.*, 489 U.S. 141, 149 (1989) ("[T]he federal patent scheme creates a limited opportunity to obtain a property right in an idea."). Thus, to ask, as the plurality here did, whether a disembodied concept is "wrapped up" in a claim directed to one of the four statutory categories, Pet. App. 20a, yields no useful insight, as the answer will in all cases be yes—particularly if, as the lower courts have done, claims are dissected and distilled until some "core" concept is revealed. This cannot be the province of a judicially crafted exception to a legislative enactment. See, *e.g.*, *United States* v. *Rutherford*, 442 U.S. 544, 559 (1979) ("Whether, as a policy matter, an exemption should be created is a question for legislative judgment, not judicial inference.").

While this Court's cases have consistently established that the abstract ideas exception extends only to preexisting, fundamental truths, that message has become garbled in communication—likely because the term "abstract idea" can have these two distinct meanings. Kevin E. Collins, Bilski *and the Ambiguity of "An Unpatentable Abstract Idea,"* 15 Lewis & Clark L. Rev. 37, 41 (2011). The problems plaguing the lower courts in applying the abstract ideas exception can be traced directly to their failure to distinguish disembodied concepts from fundamental truths—and their application of the same analysis and rationale to both. As discussed more fully below, *infra*, at 45-48, that conflation was at the heart of the plurality opinion here. This Court should clarify that the abstract ideas exception is far narrower in scope than the Federal Circuit has understood, and re-tether that judicially created exception to the statutory text.

B. In Determining Whether A Claim Recites An Abstract Idea, The Claim Must Be Read As A Whole And According To Its Terms.

A patent contains two parts: a written description and claims. The purpose of the written description is to "describ[e] the invention 'in such full, clear, concise, and exact terms as to enable any person skilled in the art ... to make and use the same.'" *Markman* v. *Westview Instruments, Inc.* 517 U.S. 370, 373 (1996) (quoting 35 U.S.C. § 112(a)). The claims play a different role: they provide notice to the public of the metes and bounds of patent protection. See 35 U.S.C. § 112(b). As this Court has explained, it is the claims that "'define[ ] the scope of a patent grant.'"

Markman, 517 U.S. at 373. Thus, the claims determine the scope of both the patentee's right to exclude and the public's right to "use[ ] or manufacture[ ]" technology "without a license" from the patentee. *Permutit Co.*, 284 U.S. at 60; see also *Cont'l Paper Bag Co.* v. *E. Paper Bag Co.*, 210 U.S. 405, 419 (1908) ("the claims measure the invention"); *Aro Mfg. Co.* v. *Convertible Top Replacement Co.*, 365 U.S. 336, 339 (1961) ("the claims made in the patent are the sole measure of the grant").

For this reason, this Court has explained that claim language, *as written*, is definitive:

> The claim is a statutory requirement, prescribed for the very purpose of making the patentee define precisely what his invention is; and it is unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms.

White v. *Dunbar*, 119 U.S. 47, 51-52 (1886); see also *McCarty* v. *Lehigh Valley R.R.*, 160 U.S. 110, 116 (1895) ("if we once begin to include elements not mentioned in the claim, in order to limit such claim ..., we should never know where to stop"). It is, therefore, improper to look to the "heart" or "gist" of an invention, rather than the actual invention as described in the claim's language. See *Aro*, 365 U.S. at 345 ("[T]here is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the inventtion ....").

A corollary to the principle that claims must be read as written is that claims must be considered as a whole. The scope of a patent claim—the scope of the patentee's right to exclude—is determined by *all* of the claim limitations in combination. Looking at any individual limitation or subset of limitations in isolation creates a distorted picture of the claimed invention, because it distorts the boundaries of what the PTO has actually found deserving of a patent and what the public may not use. *Bilski*, 130 S. Ct. at 3230 (claims must be considered "as a whole, rather than 'dissect[ing] the claims into old and new elements and then ... ignor[ing] the presence of the old elements in the analysis'") (quoting *Diehr*, 450 U.S. at 188) (alterations and omission in original); *Warner-Jenkinson Co.* v. *Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997) ("Each element contained in a patent claim is deemed material to defining the scope of the patented invention.").

In particular, the eligibility of a claim under § 101 does not turn on whether any individual element of the claim is itself patent-eligible or "novel." See *Diehr*, 450 U.S. at 188-89, 193 n.15; *Mercoid Corp.* v. *Mid-Continent Inv. Co.*, 320 U.S. 661, 667 (1944) ("The patent is for a combination only. ... [N]one of the separate elements of the combination is claimed as the invention"). "The 'novelty' of any element or steps in a process, or even of the process itself, is *of no relevance* in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Diehr*, 450 U.S. at 188-89 (emphasis added). Instead, the relevant inquiry is whether a claim, on its face, recites an abstract idea, such as a mathematical formula, and, if it does, whether it "implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect." *Id.* at 192.

The Court undertook just this inquiry in *Diehr*. The Court rejected the notion that the claim could be split up, such that the abstract idea recited in the claim—there, the Arrhenius equation—was examined separately from the claim's other elements. *Id.* at 188-89. Instead, "claims must be considered as a whole. *It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis.*" *Id.* at 188 (emphasis added). The Court explained that the contrary approach "would, if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious." *Id.*; see also *Mayo*, 132 S. Ct. at 1293 ("[T]oo broad an interpretation of [the exceptions to subject-matter eligibility] could eviscerate patent law. For all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.").

Despite this Court's analysis in *Diehr*—reaffirmed in both *Mayo*, 132 S. Ct. at 1298-99, and *Bilski*, 130 S. Ct. at 3229-30—the plurality in this case took a different approach. The plurality first undertook to "unambiguously identif[y]" the abstract idea that is supposedly "wrapped up" in Alice's claims. Pet. App. 20a, 28a. In doing so, the plurality did not, as this Court did in *Diehr*, review the actual claim language to determine whether, on their face, the claims "recite[ ] a mathematical formula (or scientific principle or phenomenon of nature)." 450 U.S. at 191. Instead, the plurality undertook its own deconstruction of the claim to find the supposed heart of the invention. Pet. App. at 28a. The plurality then undertook a separate review of "the balance of the claim," in order to determine whether any other, individual limitations were sufficiently "'inventive'"—*i.e.*, representative of a "human contribution" that is not "merely tangential, routine, well-understood, or conventional." *Id.* at 20a-23a. By paraphrasing the claim language rather than looking at its express terms, separating the claim into its constituent parts, and reviewing individual elements for novelty instead of considering whether the claim as a whole described statutory subject matter, the plurality departed dramatically from the § 101 analysis that this Court has prescribed.

The plurality suggested (Pet. App. 21a-22a) that its approach was dictated by the statement in *Mayo* that an "inventive concept" is needed if a claim is to survive § 101. 132 S. Ct. at 1294. But the plurality misread *Mayo*.

The invention in *Mayo* was a method for determining, based on the level of a metabolite in a patient's blood, whether the patient had received a therapeutically effective dose of a thiopurine drug. *Id.* at 1294-95. The sole steps recited were "'administering'" the drug and "'determining'" (by unspecified means) the resulting metabolite level in the patient's blood; and the claim concluded with two "'wherein'" clauses stating which metabolite levels indicated a need to either increase or decrease the dosage. *Id.* at 1295 (quoting patent).

In reviewing the claims, the Court first looked to the claim language as written—not to a paraphrasing of the supposed heart of the claims—and determined that the claims on their face recited a law of nature (the correlation between blood metabolite level and therapeutic efficacy). *Id.* at 1296-97. The Court then looked to whether the claims contained an "'inventive concept,'" which the Court defined as "other elements or a combination of elements ... sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself." *Id.* at 1294. In other words, the Court sought to determine whether the claim reflected "more than a drafting effort designed to monopolize the law of nature itself"—"more than simply stat[ing] the law of nature while adding the words 'apply it.'" *Id.* at 1294, 1297. The Court looked at all of the claim limitations and found that they were "not sufficient to transform an unpatentable law of nature into a patent-eligible application of such a law." *Id.* at 1298 (quoting *Flook*, 437 U.S. at 590). The Court made clear that "to consider the three steps as an ordered combination," *id.* (citing *Diehr*, 450 U.S. at 188), demonstrated that the claim indeed described nothing more than the recited law of nature because "[a]nyone who wants to make use of these laws must" perform the claimed steps, "and so the combination amounts to nothing significantly more than an instruction to doctors to apply the applicable laws when treating their patients." *Id.* The Court later emphasized this same point again, stating that "since they [the claim steps] are steps that must be taken in order to apply the laws in question, the effect is simply to tell doctors to apply the law somehow when treating their patients." *Id.* at 1299-1300; see also *id.* at 1302 ("the steps add nothing of significance to the natural laws themselves.").

The Court in *Mayo* thus did not purport to overrule or limit *Diehr* and other precedents, but instead made clear that *Diehr* continues to govern the analysis. *Id.* at 1298-99. And the Court did not, by using the term "inventive concept," license courts to disregard the actual claim language, or to dissect the claim for purposes of examining the novelty of individual limitations. Instead, the "inventive concept" inquiry asks whether additional steps in a claim that on its face recites a law of nature or fundamental truth do anything more than simply say "apply it." Steps that anyone using the law or truth necessarily must employ are just another version of "apply it," whereas steps that go beyond such essential ancillary steps reflect an "inventive concept," whether or not those steps might already have been known.

C. Claims To Computer-Implemented Inventions Are Patent-Eligible Unless They Recite No More Than A Fundamental Truth And The Instruction To "Apply It" Using A Computer.

Much of the confusion regarding computer-implemented inventions is clarified with an understanding of the proper meaning of "abstract ideas." Computers are simply a form of machine, and they function through the physical manipulation of switches. Thus, a computer-implemented invention necessarily has a physical embodiment, and cannot be an abstract idea in the sense of a disembodied concept, any more than would be an electric-motor-implemented invention or compressed-air-implemented invention.

However, unlike electric motors or air compressors, computers can be used to perform mathematical calculations. And, as shown above, this Court has recognized that mathematical formulas are abstract ideas, in the fundamental truth sense, and a claim that would preempt use of a mathematical formula is outside the scope of § 101. Thus, a computer-implemented invention that would preempt use of a mathematical formula or other fundamental truth—as did the inventions in *Benson* and *Flook*—is ineligible for patenting. Computer-implemented inventions that do *not* preempt use of a mathematical formula or other fundamental truth are eligible. Judge Rich well explained this dichotomy some 30 years ago:

> The problem here ... is not one of computer-related inventions per se; it is one of mathematics-related inventions....
>
> A computer is not mysterious to one skilled in the art; it is merely a distinct type of machine. It will facilitate understanding the applicability of patent law to computer-arts inventions if it is kept in mind that the issues under § 101 in this area have arisen because the function of the computer has been to perform mathematical operations. The problems revolve about the role of mathematics in the claimed inventions.

Application of Walter, 618 F.2d 758, 764 (C.C.P.A. 1980), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008). Explicating the distinct meanings of "abstract ideas" will help to resolve these problems.

1. Computer-Implemented Inventions Are Not Disembodied Concepts.

First, a computer-implemented invention that is either a system (in § 101 terms, a "machine") or a process cannot be an abstract idea in the disembodied concept sense. That is because a computer—whether a general purpose computer or a computer specifically constructed to perform a particular function—is a machine. See *Application of Chatfield*, 545 F.2d 152, 157 (C.C.P.A. 1976) ("we find no basis for treating methods of operating computing machine systems differently from methods of operating any other form of machine system"). And a machine, or a process that requires use of a machine, is not a disembodied concept or an idea divorced from any real-world steps or components. *Burr* v. *Duryee*, 68 U.S. (1 Wall.) 531, 570 (1863) ("A machine is not a principle or an idea."). To the contrary, a "machine" is one of the types of inventions deemed eligible for patenting under the express terms of § 101.[3] And this Court has stated that use of a machine in a process is "an important and useful clue" to patent eligibility. *Bilski,* 130 S. Ct. at 3226; see also Pet. App. 70a (stating, in discussing Alice's system claims, "[i]f tying a method to a machine can be an important indication of patent eligibility, it would seem that a claim embodying the *machine itself,* with all its structural and functional limitations, would rarely, if ever, be an abstract idea.").

Computers may seem different from other machines because they can be programmed or "configured" to perform a wide variety of functions, and because they seem to perform those functions in non-machine-like ways—*i.e.*, without gears, levers, or visibly moving parts. Indeed, as denoted by the name "computer," there is a common perception that computers function by performing computations, *i.e.*, mathematical operations, to produce numerical results that somehow are translated into other forms. But this is largely a misperception of how computers work and what they do. In fact, every computer operation involves using software to manipulate microscopic switches within computer hardware to bring about a particular result.

"Hardware" refers to the "physical components of a computer system." *Microsoft Computer Dictionary* 246 (5th ed. 2002). Among these physical components are millions of on-off switches. Ron White, *How Computers Work* 63 (9th ed. 2008). Today, these switches take "the form of microscopic transistors etched into a slice of silicon," *id.*, which switch on or off in response to the application of voltage. *See* David

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[3] Notably, none of the claims this Court has declared to be an ineligible abstract idea claimed a machine.

A. Patterson & John L. Hennessy, *Computer Organization and Design* 25 (5th ed. 2013) ("A transistor is simply an on/off switch controlled by electricity."); Neil Randall, *Dissecting the Heart of Your Computer*, PC World Magazine, June 9, 1998, at 255 ("When voltage is applied to [a transistor], it reacts by turning the circuit either on or off."). Every operation performed by a modern computer, however complex, is the result of switching transistors on or off in different combinations. See White, *supra*, at 63. "[I]t is the careful configuration of these on-off switches that produces the complex and varied functionality of modern computers." Br. for Microsoft Corp. et al., as Amici Curiae at 10, *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010) ("*Bilski* Br. for Microsoft").

The "instructions that make hardware work" are referred to as "software." *Microsoft Computer Dictionary* at 489. In the past, computers had no software; instructions were entered manually by individuals flipping switches, which created "a pattern of on and off electrical currents the computer then used to activate more electrical switches in the form of vacuum tubes." White, *supra*, at 84; see also Patterson & Hennessey, *supra*, at 1.12-3, *available at* http://tinyurl.com/PHs-1-12-3. Today, instructions are entered using computer code, which is received by the computer in the form of binary (or "machine" or "object") code, and that code causes the computer to manipulate its internal electrical connections in particular ways. White, *supra*, at 68-69. "[W]hen stored as electrical charges, the ones and zeros of the binary code produce electrical currents that literally (but temporarily) reconfigure the electronic pathways running between transistors in the same way that human operators reconfigured the wiring of [early computers] by hand." *Bilski* Br. for Microsoft at 12 n.4. Only by reconfiguring these electronic pathways can the hardware be made to perform any useful operations.

In short, computer hardware contains millions of electronic pathways that can be configured to perform different operations. Software causes the hardware to manipulate these electronic pathways such that those operations can actually be carried out. Thus, systems that contain a computer, and methods that are implemented with a computer, necessarily exist in the physical, rather than purely conceptual, realm. A claim that recites specific use of a computer therefore cannot be an abstract idea in the disembodied concept sense of the term.

The plurality agreed that "[a] particular computer system, composed of wires, plastic, and silicon, is no doubt a tangible machine.... Claims to computers were, and still are, eligible for patent." Pet. App. 40a. The plurality went on, however, to say, "[we] have before us not the patent eligibility of specific types of computers or computer components, but computers that have routinely been adapted by software consisting of abstract ideas, and claimed as such, to do all sorts of tasks that formerly were performed by humans." *Id.* In this, the plurality erred on multiple counts. Software does not "consist[ ] of abstract ideas"—it is, rather, the "instructions that make hardware work." *Microsoft Computer Dictionary*, *supra*, at 489. The "tasks" actually specified in Alice's claims were never, and could not have been, "formerly performed by humans." And, whatever software may be used to adapt a computer cannot change the fact that a computer system, or a method that uses a computer, necessarily involves a physical implementation—not merely a disembodied concept. See *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994) (en banc); Pet. App. 93a ("A claim to a computer running particular software is no less a claim to a computer.").

Moreover, like any patent claim, a claim to a computer-implemented invention must be read as a whole and according to its express terms. Thus, when considering a claim that recites a computer or use of a computer, it is improper to focus solely on the software's instructions while ignoring the computer's physical components that implement those instructions. That would be so even if it were true that the recited computerized functions "formerly were performed by humans." Pet. App. 40a. Because computers are indisputably "tangible," *id.*, and function through physical means, computer-implemented inventions do not fall outside the four § 101 categories on the ground that they are disembodied concepts.

2. Computer-Implemented Inventions May Be Ineligible If They Claim No More Than A Fundamental Truth.

A claim to a computer-implemented invention may, however, be ineligible if it would preempt the use of a fundamental truth. This can occur in several ways. If a claimed invention uses a computer simply to execute a mathematical formula, the claim is ineligible, because limiting the claim to use of the formula on a computer, like limiting it to use in catalytic conversion or some other field, does not change the fact that the claim would preempt use of the formula as such. See *Benson*, 409 U.S. at 71-72; *Mayo*, 132 S. Ct. at 1298. Similarly, claims that recite only insignificant pre- or post-solution activity, such as steps necessary to any practical use of the formula—*i.e.*, inputting numbers into a mathematical formula, *Bilski*, 130 S. Ct. at 3231, or reporting the results of a mathematical calculation, *Flook*, 437 U.S. at 590—cannot "transform" an ineligible abstract idea "into a patent-eligible application" of the idea. *Mayo*, 132 S. Ct. at 1298. To allow such a claim would effectively preempt use of the mathematical formula itself, thus removing a "basic tool[ ]," *Benson*, 409 U.S. at 67, from the "storehouse of knowledge," *Funk Bros. Seed*, 333 U.S. at 130.

That is precisely why the Court deemed ineligible the claims at issue in *Benson* and *Flook*. In *Benson*, the Court explained that "[t]he mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." 409 U.S. at 71-72. Similarly, in *Flook*, the Court explained that "Respondent's application simply provides a new and presumably better method for calculating alarm limit values.... [I]f a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory." 437 U.S. at 594-95 (internal quotation marks omitted). The process claimed in *Diehr*, however, preempted only a specific application of a mathematical formula:

> [T]he respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.

450 U.S. at 187.

These precedents demonstrate that the patent eligibility of computer-implemented inventions is determined using the same principles as other inventions. Simply put, if the claim would preempt the use of a mathematical formula or the like as such, the claim is ineligible. See *Examination Guidelines*, 61 Fed. Reg. at 7484 ("A claimed process that consists solely of mathematical operations is non-statutory whether or not it is performed on a computer."). That is, if the claim recites a mathematical formula and an instruction to "apply it on a computer" (or an equivalent instruction), or to take other steps inherent to use of the formula, it fails § 101. If the claim does not, on its face, recite a mathematical formula or other fundamental truth, it is eligible. And, if the claim recites a particular application of a mathematical formula, such that others would not be foreclosed from using the formula in other practical applications, it is eligible.

Of course, even a claim directed to eligible subject matter must satisfy other requirements. See *Bilski*, 130 S. Ct. at 3225 (§ 101 is "only a threshold test"). Thus, to gain patent protection, a computer-implemented invention must be novel under § 102 and nonobvious under § 103, and must also fulfill the disclosure requirements of § 112. Section 112 can play a particularly important role in ensuring that claims to computer-implemented inventions are not so broad or vague that they grant unjustified monopolies over entire fields of endeavor. See Exec. Office of the President, *Patent Assertion and U.S. Innovation* 7-8, 13 (June 2013), *available at* http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf (problems of overbroad claims using "functional" language are "especially acute for software patents"; recommending "clearer patents with a high standard of novelty and non-obviousness"); Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905. As explained above (*supra*, at 3-4), under § 112 a patent application's specification must establish that the applicant actually has possession of, *i.e.*, actually invented, what he or she claims. It must describe the claimed invention in sufficient detail to enable those of ordinary skill in the field to practice the claimed invention, thus ensuring that the public will have the full benefit of the invention when the patent expires. And, it must identify the precise scope of the claimed invention, so that the public knows "which features may be safely used or manufactured without a license and which may not." *Permutit Co.*, 284 U.S. at 60. Strict compliance with § 112's requirements—which this Court will soon address in *Nautilus, Inc.* v. *Biosig Instruments, Inc.*, No. 13-369—will ensure that patents granted for computer-implemented inventtions will "leave room for later entrants to design around the patent and develop different" ways to achieve the same result. Lemley, 2013 Wis. L. Rev. at 947.

II. ALICE'S CLAIMS ARE DIRECTED TO ELIGIBLE SUBJECT MATTER.

Unlike the unsuccessful patent applicants in *Benson*, *Flook*, and *Bilski*, Alice holds issued patents. The claims are therefore presumed valid, and the burden to present clear and convincing evidence to establish their invalidity rests on CLS. 35 U.S.C. § 282; *Microsoft Corp.* v. *i4i Ltd. P'ship*, 131 S. Ct. 2238, 2245 (2011). Applying the principles set forth above leaves no doubt that CLS cannot carry that burden.

Under a proper analysis, a claim that on its face recites a statutory category of invention, and does not on its face recite a law of nature or a fundamental truth like a mathematical formula, passes muster under § 101, and its ultimate patentability is determined by the other statutory criteria. That is true of Alice's claims. The claims do not, as written, recite any fundamental truth. Moreover, even if they were somehow found to incorporate a fundamental truth, the claims—read as a whole—do not preempt the use of any fundamental truth as such, but instead apply it in a narrow and specific way.

A. Alice's Claims Do Not Recite An Abstract Idea.

Alice has not claimed any fundamental truth. This is evident from the claim language. Nowhere do the claims recite a mathematical formula, a "'fundamental economic practice'" that can be "reduced to a mathematical formula," *Bilski*, 130 S. Ct. at 3231, or any other form of fundamental truth that "exists in principle apart from any human action," *Mayo*, 132 S. Ct. at 1297. To the contrary, the claims recite a specific series of steps, a specific configuration of computer hardware, or a specific computer program product, for establishing electronic shadow accounts held by a supervisory institution, electronically adjusting those shadow accounts, and irrevocably instructing exchange institutions to provide delivery. *Supra*, at 6-10. Because the claims do not even *recite* a fundamental truth, they cannot, *a fortiori*, "tie up" all practical uses of any fundamental truth. *Mayo*, 132 S. Ct. at 1301. The claims, by their terms, are directed to eligible subject matter under § 101.

Despite the claim language, the plurality concluded that the claims "draw on the abstract idea of reducing settlement risk by effecting trades through a third-party intermediary ... empowered to verify that both parties can fulfill their obligations before allowing the exchange—*i.e.*, a form of escrow." Pet. App. 28a. According to the plurality, this "is an abstract idea because it is a 'disembodied' concept, a basic building block of human ingenuity, untethered from any real-world application. Standing alone, that abstract idea is not patent-eligible subject matter." *Id.* (citation omitted). The plurality's analysis was doubly flawed.

First, the plurality conflated the two different meanings of abstract idea, purporting to apply the preemption-focused analysis this Court has prescribed for claims that recite fundamental truths, even though Alice's claims do not do so. Indeed, not even the plurality suggested that the supposed "abstract idea" it identified in Alice's claims was a preexisting fundamental truth akin to a mathematical formula or law of nature that "reveals a relationship that has always existed," *Flook*, 437 U.S. at 593 n.15. And it is evident that the alleged "abstract idea" the plurality identified bears no resemblance to the fundamental, mathematical truths at issue in this Court's prior cases.

Instead, the plurality found Alice's claims ineligible by holding the "concept" upon which they supposedly "draw" to be "an abstract idea *because it is a 'disembodied' concept.*" Pet. App. 28a (emphasis added).[4] But, as explained above, the Court's cases addressing the abstract ideas exception apply that analysis only to *fundamental truths*—not disembodied concepts. It is only claims directed to fundamental truths that raise the preemption risks the Court described in *Benson*, *Flook*, *Bilski*, and *Mayo*—

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[4] Chief Judge Rader's opinion made much the same error in analyzing the method claims. *See* Pet. App. 82a.

and only those claims can, consistent with the statutory text, be deemed ineligible despite fitting within the four statutory categories.[5]

Indeed, the approach taken by the plurality is not only nonstatutory, but nonsensical. Every process claim can be characterized as "draw[n] to," at bottom, a disembodied concept. Claims that recite a statutory process do not fall outside the scope of § 101 merely because a reviewing judge can craft a conceptualization of an invention. Instead, it is only when the claims are *indistinguishable* from a disembodied concept that they fail § 101, and they do so because disembodied concepts, *standing alone*, do not fit within the four categories of § 101. But, of course, Alice's claims are not directed to disembodied concepts *standing alone*. And neither the plurality nor the district court suggested they were, finding instead that Alice's claims as a whole fall within the four statutory categories. The plurality's conflation of the two forms of abstract ideas doomed its analysis.

Second, the plurality erred by paraphrasing and dissecting the language of Alice's claims in its hunt for a disembodied concept, instead of reviewing the claims as a whole and as written. The plurality began by extracting the supposed abstract idea from the balance of the claim, and reviewing that idea "[s]tanding alone." Pet. App. 28a; see also *id.* at 82a (Rader, C.J.). According to the plurality, "[t]he concept of reducing settlement risk by facilitating a trade through third-party intermediation is an abstract idea because it is a 'disembodied' concept ... *untethered from any real-world application.*" *Id.* at

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[5] The lower courts agreed that Alice's claims are directed to the four statutory categories. *See* Pet. App. 28a, 33a, 36a, 40a, 194a, 226a-27a.

28a (emphasis added). But it was the plurality's dissection of the claims that "untethered" that concept from the "real-world application" called for by the actual claim language. Alice did not purport to claim "the concept of reducing settlement risk by facilitating a trade through third-party intermediation," but instead claimed systems and methods using computers specifically configured to, *inter alia*, create electronic shadow accounts, electronically adjust those shadow accounts, and ultimately issue irrevocable instructions to exchange institutions to provide delivery.

Indeed, the repeated references in the Federal Circuit's opinions to Alice's claims as a form of "escrow," Pet. App. 28a, 30a, 34a, 77a, 78a, 79a, 82a, 83a, 84a, 110a, 112a, 118a, 141a, highlight the flaws in the approach taken below. The dictionary definition of escrow is "[m]oney, property, a deed, or a bond put into the custody of a third party for delivery to a grantee only after the fulfillment of the conditions specified." *American Heritage Dictionary*, *supra*, at 608. Nothing in the concept of escrow requires electronic shadow records, much less the particular use of electronic shadow records required by Alice's claims. Moreover, Alice's claims do not prescribe that the electronic intermediary (or any other third party) receives any money or property, and the only "deliveries" required by Alice's claims occur to the accounts of the actual parties after the transaction has been effected. Alice's invention and the concept of escrow may both seek to mitigate transactional risk, but they do so in materially different ways. See Lemley, 2013 Wis. L. Rev. at 955 ("It is the way, not the function, that patent law is supposed to protect."). As the lower court's faulty analysis illustrates, approaching § 101 by first stripping a claim of its actual limitations to isolate some supposed abstract idea at its core so thoroughly divorces the analysis from the actual invention that the way the invention as a whole functions is lost, and the "abstract idea" that is left standing when the limitations are removed has little or nothing to do with the actual invention. That is precisely the result this Court rejected in *Diehr*, when it explained that "claims *must be considered as a whole*. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis." 450 U.S. at 188 (emphasis added).

B. Even If Alice's Claims Could Somehow Be Read To Recite An Abstract Idea, They Do Not Claim An Abstract Idea In Itself.

But even if the claims could somehow be read to recite the supposed "abstract idea" of "third-party intermediation," Pet. App. 29a, they are directed to a specific application of that idea—not to the idea itself. The claim limitations—including in particular those requiring computer implementation—mean that the invention as claimed is not an abstract idea.

Alice's claims require a substantial and meaningful role for the computer—beyond merely performing computations more quickly or accurately than a person could do with pencil and paper—in performing the recited steps. The computer *is itself the intermediary*. See JA958 (reciting, *inter alia*, "a computer ... that is configured to (a) receive a transaction; (b) electronically adjust [accounts] ...; and (c) generate an instruction"); JA383-84 (reciting computer-implemented steps, including "creating" shadow records, "obtaining" balance information, "adjusting" the shadow records in chronological order, and "instructing" exchange institutions to provide delivery). The use of the computer to track multiple transactions, in chronological order, and to issue simultaneous instructions at the appropriate time—regardless of the geographic locations of the parties, their time zones, or the particular exchange institutions they employ—is central to the claimed methods. The invention as claimed will not function without a computer configured (*i.e.*, programmed) to carry out the claim steps. Moreover, a computer and other hardware specifically structured and configured to perform the recited functions are essential to the claimed systems.

Alice's claims also cannot be interpreted to recite generically the idea of third-party intermediation applied on a computer. The claims do not recite this idea, and, in any event, they include steps or elements other than those necessary to any use of the idea. That is, the claims recite specific *ways* of accomplishing third-party intermediation—while leaving all other ways available. For instance, the claims require that the computer maintain two shadow accounts that are "independent" from the parties' real-world accounts. *E.g.*, JA1260. A differently designed computer system could implement exchanges in other ways. It could, for example, track the parties' real-world accounts rather than creating independent shadow accounts housed on the patented system. Or it could require a different configuration of shadow accounts, with, for example, a new shadow account created with each new exchange obligation rather than a single shadow account that is adjusted throughout the "day." Similarly, the claims require that the computer "adjust" the shadow accounts chronologically, and do not permit *any* transaction that will even temporarily create a net debit balance. *E.g.*, JA384. A differently designed system could, for example, adjust the shadow accounts based on the size rather than timing of the transactions, could adjust the shadow accounts for a wider variety of other transactions, could adjust the shadow accounts only at specified times rather than for every transaction, and so on. The claims also require that the system issue "an irrevocable, time invariant obligation" to provide delivery at the end of a period of time. JA1260. A differently designed system could, for example, simply report that the conditions for delivery had been met, rather than issue an irrevocable, time invariant instruction that causes delivery to occur. These few examples demonstrate that the limitations recited in Alice's claims define an invention very different, and far narrower, than simply "applying" the idea of third-party intermediation on a computer.

Alice's claims thus stand in stark contrast to the claims at issue in *Benson*, *Flook*, *Bilski*, and *Mayo*. In each of those cases, the Court made clear that the claims recited nothing more than an abstract idea or law of nature and—at most—entirely insignificant post-solution activity. In *Flook*, the post-solution activity was simply "adjust[ing]" the alarm limit (itself simply a number) to reflect the result of the computer's calculations. 437 U.S. at 585. In *Mayo*, the post-solution activity was simply to "apply" the law of nature to the patient. 132 S. Ct. at 1298. And in *Benson* and *Bilski*, there was no post-solution activity to speak of. *Benson*, 409 U.S. at 64; *Bilski*, 130 S. Ct. at 3223-24. Unlike the claims at issue in those cases, Alice's claims *do* require other steps not inherent to the idea of third-party intermediation.

Alice's claims are therefore far more similar to the claims in *Diehr*, which, like Alice's, recited multiple steps beyond use of an abstract mathematical formula. 450 U.S. at 187. In *Diehr*, the only use of the Arrhenius equation that was foreclosed as a result of the patent was "use of that equation in conjunction with all of the other steps in their claimed process.... includ[ing] installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time." *Id.* Likewise, here, the only uses of the concept of third-party intermediation that are foreclosed are those meeting *all of the specific limitations* in Alice's claims—*inter alia*, using the required configurations of computer hardware; using the required independent shadow accounts; and performing the continuous, chronological adjustment of the shadow accounts and issuing irrevocable instructions.

The plurality reached a different conclusion by misreading the claim language and improperly dissecting the claims. For example, in reviewing Alice's method claims, the plurality began with the statement that "[u]nless the claims require a computer to perform operations that are not merely accelerated calculations, a computer does not itself confer patent eligibility," and concluded that the computer recited in Alice's claims did not "materially narrow[ ] the claims relative to the abstract idea they embrace." Pet. App. 29a-30a. The plurality then *separately* addressed the functions of creating and adjusting shadow records and providing end-of-day instructions—without acknowledging that Alice's claims require that those functions be performed *by a* *computer*. *Id.* at 30a-31a.[6] The plurality also dismissed the requirement for independent shadow records by characterizing the term "shadow record" as "extravagant language to recite a basic function required of any financial intermediary in an escrow arrangement—tracking each party's obligations and performance." *Id.* at 30a. But the plurality simply ignored the requirement that the shadow records be "independent[ly]" maintained on a "data storage unit" and "electronically adjust[ed]" by the claimed computer—thereby ignoring that "tracking each party's obligations and performance" could be accomplished in other ways without any of those required elements. And the plurality dismissed the requirement for an irrevocable instruction as "trivial," stating that "[w]hether the instructions are issued in real time, every two hours, or at the end of every day, there is no indication in the record that the precise moment chosen to execute those payments makes any significant difference in the ultimate application of the abstract idea." *Id.* at 30a-31a. With this statement, the plurality confirmed that the actual claim language and actual claim limitations were entirely irrelevant to its analysis, simply because the claimed method accomplished the supposed abstract idea the plurality had projected onto it.

The plurality compounded its error with regard to Alice's system claims. Although the plurality recognized that a computer system is "a tangible machine," Pet. App. 40a, it concluded that Alice's system claims were not directed to such a machine because the claimed systems do "tasks that formerly were performed by humans," and "merely adding existing computer technology to abstract ideas—mental steps—does not as a matter of substance convert an abstract idea into a machine." *Id.* at 40a-41a. Again, however, the plurality simply overlooked the actual limitations in Alice's claims and corresponding specification. As Chief Judge Rader explained, the system claims recite specific hardware, configured to perform the specific computerized functions of creating shadow accounts, adjusting them in a particular way, and then issuing instructions. And the specification lays out how to program a computer system to perform these functions. See *id.* at 73a-78a; see also, *e.g.*, JA1023, 1031-35. While the claims must still be evaluated under §§ 102, 103, and 112, and it will be CLS's burden to establish that these issued claims fail those statutory tests, they plainly pass the "threshold test" of § 101. *Bilski*, 130 S. Ct. at 3225.

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[6] Again, Chief Judge Rader made much the same error in assessing the method claims. Pet. App. 83a-84a.

III. ARTICULATING THE PROPER APPLICATION OF THE ABSTRACT IDEAS EXCEPTION WILL PROVIDE MUCH-NEEDED CLARITY TO COURTS, LITIGANTS, AND INNOVATORS.

Clear standards are essential in patent law. See, *e.g.*, *Bilski*, 130 S. Ct. at 3231 (Stevens, J., concurring in the judgment) ("In the area of patents, it is especially important that the law remain stable and clear."); *Festo Corp.* v. *Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 730-31 (2002). The lower courts, however, have proved unable to derive clear guidance from this Court's statements concerning the abstract ideas exception. In particular, lower courts have misinterpreted some of the Court's decisions—particularly *Flook* and *Mayo*—to authorize a dissection of claims to search for an abstract idea, vaguely defined, at their core. See, *e.g.*, Pet. App. 20a (citing *Mayo*, 132 S. Ct. at 1302-03); Pet. App. 214a; *Accenture Global Servs., GmbH* v. *Guidewire Software, Inc.*, 728 F.3d 1336, 1341 (Fed. Cir. 2013).

Such an approach is not just contrary to this Court's case law and the statutory text. It is entirely unworkable, because if the "true invention" is to be defined other than by the actual language of the claims, the § 101 analysis becomes untethered to anything other than a party's or judge's subjective views concerning the supposed heart of the claim. This approach inevitably becomes result-driven—the "heart" of the invention is defined, consciously or not, to fit the definer's preconceived idea concerning the invention's eligibility. Such uncertainty imposes real costs on courts, litigants, innovators, and the broader economy.

Indeed, the costs of the current confusion can be vividly seen in this case. CLS initiated this action in 2007, nearly seven years ago. But with the exception of one discrete issue having to do with extraterritoriality, the *only* issue thus far addressed is patent eligibility. And, even as to that issue, after seven years of litigation, the reviewing judges have been unable to reach consensus as to what supposedly abstract idea is contained in the claims, with the district court offering one formulation, Pet. App. 214a, various Federal Circuit judges others, *id.* at 28a (Lourie, J.), *id.* at 82a (Rader, C.J.), and CLS still others, Br. of CLS at 7-8, *Alice*, 685 F.3d 1341 (Fed. Cir. filed Sept. 9, 2011). And, not one of these supposed abstract ideas is actually recited in the claims.

Improved clarity as to the abstract ideas exception is of particular importance in the area of computer-implemented inventions. As the Court has recognized, any claim can be reduced to seemingly abstract principles or laws of nature, *Mayo*, 132 S. Ct. at 1293, and this is particularly true in the case of computer-implemented inventions, which can be made to appear (incorrectly) to be nothing more than collections of mathematical calculations with data-gathering and post-solution-output steps that are readily deemed "insignificant." An approach to § 101 that fails to recognize that a computer is a physical machine that operates in the physical world by employing physical operations to produce physical results—even if some of the physical aspects (*e.g.*, electrical signals, configurations of semiconductor circuits, *etc.*) are not readily observable—will decimate entire sectors of the economy and stifle innovation. See Pet. App. 85a-86a & n.1.

While some commentators may clamor for further limits on the nature of inventions eligible for patent protection, that is a job for Congress—not the courts. Congress has, where it deemed necessary, addressed perceived problems with patents on particular technologies. See, *e.g.*, 42 U.S.C. § 2181(a) (nuclear weapons); 35 U.S.C. § 287(c) (medical activities); Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 18, 125 Stat 284, 329-30 (2010) (business methods). If Congress deems it necessary to create specific rules for computer-implemented inventions, it can do so. The courts, in contrast, are neither constitutionally empowered, nor institutionally equipped, to conduct the sorts of inquiries needed to set national economic and industrial policy. See *i4i*, 131 S. Ct. at 2252; see also *Pavelic & LeFlore* v. *Marvel Entm't Grp.*, 493 U.S. 120, 126 (1989) ("Our task is to apply the text, not to improve upon it.").

CONCLUSION

For the foregoing reasons, the Court should reverse the judgment below and remand the case for further proceedings.

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RESPONDENT'S BRIEF

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CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,

Respondents.

On Writ Of Certiorari
To The United States Court Of Appeals
For The Federal Circuit

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QUESTION PRESENTED

An abstract idea, including a fundamental economic concept, is not eligible for patenting under 35 U.S.C. § 101. *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3231 (2010). Adding conventional elements to an abstract idea does not render it patent-eligible. *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1298 (2012). The asserted claims of the patents-in-suit recite the fundamental economic concept of intermediated settlement, implemented using conventional computer functions. The question presented is:

Whether the courts below correctly concluded that all of the asserted claims are not patent-eligible.

PARTIES TO THE PROCEEDING AND RULE 29.6 STATEMENT

All parties to the proceeding are identified in the caption.

CLS UK Intermediate Holdings Ltd. is a publicly held corporation that owns 10% or more of the stock in CLS Bank International and CLS Services Ltd. In addition, CLS UK Intermediate Holdings Ltd. is owned (100%) by CLS Group Holdings AG.

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INTRODUCTION

Respondents CLS Bank International and CLS Services Ltd. built and operate, at a cost to date of more than $1 billion, a global network that safely and efficiently settles over $5 trillion in foreign exchange transactions each day. CLS Bank is a systemically important financial institution that is critical to the stable functioning of the worldwide currency market.

Petitioner Alice Corporation Pty., Ltd. contends that the CLS system infringes "business method" patents that broadly claim a computerized form of intermediated settlement. Although Alice does not practice this method itself, it seeks damages and other relief against CLS.

Alice's patents were issued under a permissive standard for patent eligibility that was abrogated in *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010), and *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012). The asserted claims recite the basic economic concept of intermediated settlement or escrow. Thus, like the ineligible claims in *Bilski*, they purport to monopolize "a fundamental economic practice" of "protecting against risk." 130 S. Ct. at 3231. The inclusion of routine and conventional computer functions does not transform Alice's ineligible claims into eligible ones. Just as "one must do more than simply state [a fundamental principle] while adding the words 'apply it'" (*Mayo*, 132 S. Ct. at 1294), it is not enough to recite a basic economic concept and say "compute it." Yet, that is all Alice has done.

Allowing patent claims like these would effectively foreclose the productive use of economic concepts and other fundamental principles in our increasingly computerized Information Age, in contravention of the Constitution and the Patent Act. Accordingly, the judgments below, which correctly concluded that all of the asserted claims are not patent-eligible, should be affirmed.

STATEMENT

Alice alleged that CLS infringes several claims of four related patents. D.C. Dkt. Nos. 6, at 4–12 & 90, at 4–14. The district court entered summary judgment for CLS on the ground that all of the asserted claims are not patent-eligible under 35 U.S.C. § 101. Pet. App. 238a. The Federal Circuit, sitting en banc, affirmed the district court's judgment. Pet. App. 1a–2a.

1.a. Alice is the owner of U.S. Patent Nos. 5,970,479, 6,912,510, 7,149,720, and 7,725,375. These patents have largely overlapping specifications (Pet. Br. 7; Pet. App. 154a), which describe multiple inventions that are covered by two distinct sets of claims. Most of the original specification, and the great majority of the drawings, relates to claims 1–32 and 35–39 of the '479 patent, which involve the formation of certain multi-party contracts. Alice has *not* asserted these claims against CLS.

The asserted claims—claims 33 and 34 of the original '479 patent and all claims of the follow-on '510, '720, and '375 patents (Pet. App. 4a)—recite "a form of escrow" (*id.* at 28a), or intermediated settlement, designed to mitigate the risk that only one party to a transaction will perform its contractual obligations at settlement. The '479 and '510 patents contain method claims; the '720 patent contains system claims; and the '375 patent contains both system claims and media claims. *Id.* at 4a. Only a limited portion of the specification pertains to the asserted claims. BIO 5–6; *see* App., *infra*, 1a–6a (excerpts from the '479 specification showing column and line designations).

Method claim 33 of the '479 patent is representative, as Alice concedes (Pet. Br. 8) and the courts below recognized (Pet. App. 26a, 80a, 134a, 176a–77a). *See* J.A. 383–84. In Alice's method, a third-party middleman stands between counterparties to one or more transactions. Pet. App. 25a–27a. This intermediary maintains "shadow" accounts for each counterparty and, so long as these accounts have adequate value, adjusts them according to the terms of the parties' agreement(s). *Id.* at 26a–27a. At some point in the day, the middleman sends final instructions so that real-world accounts reflect the changes to the shadow accounts. *See id.* at 164a–65a.

There is no indication that Alice has ever put the patents to any productive use. So far as the record discloses, Alice has never built a computer system capable of settling transactions according to the claimed method, has never written instructions to program any computer to perform the method, and has never practiced any of the asserted claims. Rather, Alice's business apparently consists of asserting these patents in litigation. Alice is thus what is commonly known as a non-practicing entity or a patent-assertion entity. Alice selected CLS as its first target.

b. CLS "may be the most important bit of the financial infrastructure you have never heard of." *Special FX*, The Economist, Sept. 21, 2013, at 81. CLS Bank was chartered as an Edge Corporation under Section 25A of the Federal Reserve Act, 12 U.S.C. § 611, and is subject to cooperative oversight by central banks from around the world pursuant to an arrangement coordinated by the Federal Reserve. *See* Peter Hoflich, *Banks at Risk: Global Best Practices in an Age of Turbulence* 174–76 (2011). CLS Services is located in London and provides support and technology-related services to CLS Bank. CLS, Corporate Governance, www.cls-group.com/About/CG/Pages/default.aspx.

The mission of both CLS entities is to mitigate settlement risk—*i.e.*, the risk that one counterparty will perform and the other will fail to do so—in global currency transactions by ensuring that certain payment obligations have been fulfilled under CLS's rules before directing the transfer of entitlement.

CLS was decades in the making. *See* Alexandra Schaller, *Continuous Linked Settlement: History and Implications* 32–55 (Dec. 5, 2007) (unpublished dissertation, University of Zurich), *available at* http://opac.nebis.ch/ediss/20080261.pdf. Spurred by the 1974 failure of Bankhaus Herstatt and other crises affecting the foreign exchange market (*see id.* at 33–38), the international banking community, including both private institutions and regulators, began investigating a world-wide system that would apply established techniques of financial intermediation on a global scale to ensure the settlement of foreign exchange transactions across borders and time zones. *Id.* at 38–45; *see also*, *e.g.*, Comm. on Payment Settlement Sys. of the Cent. Banks of the Grp. of Ten Countries, *Settlement Risk in Foreign Exchange* (1996). This effort ultimately led the Group of Twenty to create CLS. Schaller, *supra*, at 47–55.

The basic concept of intermediated settlement was well-known, having long been used by both central banks and private-sector clearing houses. Schaller, *supra*, at 48–49. The "new development" that CLS brought to the marketplace when it began operating in 2002 (*see* Pet. Br. 11) was not this underlying concept but, rather, the complex legal, financial, technological, and political solution that CLS put in place. *See generally* Schaller, *supra*, at 69–70. Creating this global network to securely, accurately, and efficiently process a huge number of foreign exchange transactions from around the world has cost well over $1 billion to build and operate.

Today, CLS processes over $5 *trillion* of foreign exchange transactions per day. CLS plays a critical role in the safety of the global currency exchange market, which is the largest financial market in the world. Foreign exchange facilitates international trade and enables central banks to manage monetary policy.

CLS's role in securing and stabilizing the foreign exchange market is critical, as recent financial dislocations have illustrated. *See* CLS, History, www.cls-group.com/About/Pages/History.aspx. In July 2012, CLS Bank was one of the eight entities initially designated by the Financial Stability Oversight Council (FSOC), chaired by the Secretary of the Treasury, as a "systemically important" component of the U.S. financial system. *See* FSOC, 2012 Annual Report, Appendix A at 145. As the FSOC explained, a "long-term disruption to CLS Bank may significantly increase settlement risk and liquidity demands in the [foreign exchange] market," in turn disrupting "the flow of funds in U.S. and foreign financial markets and to the broader economy." *Id.*

at 154; *see also* Determination of Foreign Exchange Swaps and Foreign Exchange Forwards Under the Commodity Exchange Act, 77 Fed. Reg. 69,694, 69,701 (Nov. 20, 2012) (recognizing CLS's importance in securing the foreign exchange market).

2. After Alice threatened a patent-infringement suit, CLS Bank initiated the underlying declaratory judgment action. D.C. Dkt. No. 1, at 1. Alice counterclaimed for infringement against both CLS Bank and CLS Services. D.C. Dkt. Nos. 6, at 4–12 & 90, at 4–14. Alice seeks damages as well as unspecified further relief. D.C. Dkt. No. 90, at 14.

CLS and Alice filed cross-motions for summary judgment on the question whether the asserted claims are patent-eligible under 35 U.S.C. § 101. D.C. Dkt. Nos. 43, 54, 94, 95. The district court held the motions pending this Court's decision in *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010), and, after additional briefing, issued an exhaustive opinion analyzing every asserted claim. Pet. App. 172a–238a.

"For the purpose of deciding patent eligibility at the district court, the parties agreed to a broad claim construction that was favorable to Alice. The district court concluded that each [asserted] claim ... requires computer implementation." Pet. App. 155a. No other claim limitations were disputed for purposes of the Section 101 analysis.

The district court held that the method claims are not patent-eligible because they recite the "abstract idea of employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk," which the court determined to be "a basic business or financial concept much like" the hedging method deemed unpatentable in *Bilski*. Pet. App. 214a. The court held that because financial transactions "are increasingly likely to be monopolized by electronic and computer implementation and storage, the fact these claims are implemented electronically fails to limit the methods." *Id.* at 221a.

The district court further held that the system claims likewise "represent merely the incarnation of this abstract idea on a computer" and "would preempt the use of the abstract concept … on any computer, which is, as a practical matter, how these processes are likely to be applied." Pet. App. 231a. The court explained that Alice's claims do not recite "software or program code." *Id.* at 227a n.21. As Alice's expert acknowledged, the system could comprise any "personal computer[] [or] mini- or mainframe computer[]." *Id.* at 225a.

Finally, the court held that the media claims "are also directed to the same abstract concept despite the fact they nominally recite a different category of invention under § 101." Pet. App. 237a.

The district court found that all of Alice's asserted claims would "effectively preempt the use of an electronic intermediary to guarantee exchanges across an incredible swath of the economic sector" and "an infinite array" of transactions. Pet. App. 218a–20a, 232a, 234a. The court rejected Alice's contention that the asserted claims could be "limited to 'specific applications' of a[] fundamental concept"; to the contrary, examining them "as a whole" confirmed that "they would serve to patent the fundamental and abstract concept itself." *Id.* at 220a–21a.

3. After a divided panel of the Federal Circuit reversed (Pet. App. 132a–71a), the court of appeals granted CLS's petition for rehearing en banc, vacated the panel decision, and requested additional briefing. *Id.* at 239a–41a. Following argument, the

en banc court issued a per curiam order affirming the district court's judgment. *Id.* at 1a–2a. The participating judges voted 7-3 to affirm the district court's judgment as to the method and media claims, while the judgment as to the system claims was affirmed by an equally divided court. *See id.* at 3a n.1. The judgment order was accompanied by six separate opinions, none of which commanded a majority.

a. Judge Lourie, writing for a five-member plurality, explained that none of the asserted claims are patent-eligible under *Bilski* and the intervening decision in *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012).

Alice's method claims are ineligible, the plurality concluded, because they are founded on the "abstract idea" of "reducing settlement risk by facilitating a trade through third-party intermediation." Pet. App. 28a. Under the *Mayo* methodology, "adding generic computer functions to facilitate performance provides no substantial limitation and therefore is not 'enough' to satisfy § 101." *Id.* at 31a.

The media and system claims fared no better, the plurality determined. Although formally drawn to physical objects, these claims "provide for computer implementation" at a "striking level of generality." Pet. App. 37a. They "recite a handful of computer components in generic, functional terms that would encompass any device capable of performing" the computer-implemented methods. *Ibid.*

b. Chief Judge Rader and Judge Moore dissented in part. They agreed with the plurality that the method claims, as well as the media claims, are ineligible because they recite an abstract idea. Pet. App. 80a–84a. But they viewed the system claims as patent-eligible on the ground that "tangible" computer components, such as a "data storage unit," could not be "abstract." *Id.* at 70a–71a, 86a–87a, 97a–99a.

c. Judges Linn, O'Malley, and Newman dissented; they would have held all of the asserted claims patent-eligible. Judges Linn and O'Malley believed that Alice's computer implementation alone sufficed to confer eligibility. Pet. App. 123a–26a. Judge Newman maintained that "when the subject matter is within the statutory classes in section 101, eligibility is established." *Id.* at 111a; *see also id.* at 101a.

SUMMARY OF ARGUMENT

Laws of nature, natural phenomena, and abstract ideas are not patent-eligible under this Court's established construction of 35 U.S.C. § 101. The asserted claims of Alice's patents are ineligible under that standard because they attempt to monopolize the abstract idea of intermediated settlement.

I. In *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010), this Court unanimously concluded that hedging, a fundamental principle of risk management, was an "abstract idea." The risk-management principle at issue here—intermediated settlement or escrow—is conceptually no different and thus similarly ineligible for patent protection under Section 101. Alice tries to avoid this conclusion by advancing a constricted reading of *Bilski* under which the prohibition against patenting abstract ideas would reach only mathematical formulas. But Alice's redefinition does not square with this Court's longstanding understanding of abstract ideas and, indeed, would have led to a different result in *Bilski* itself. Under *Bilski*, the asserted claims recite a patent-ineligible abstract idea.

II. The claims asserted by Alice do not include "significantly more" than the abstract idea of intermediated settlement, such that they could be patent-eligible under *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012). Alice fails to come to grips with the analytical approach this Court articulated in *Mayo*, which requires an "inventive concept." Alice's claims do not satisfy this requirement. They recite only off-the-shelf computer components performing routine and conventional functions, which neither add to nor subtract from patent eligibility. The claim elements, considered separately and as an ordered whole, do not contain enough to transform the underlying ineligible abstract idea into an eligible invention.

III. Unless the Court is prepared to renounce *Bilski* and *Mayo*—which were unanimous on the key points applicable here—the judgments below can only be affirmed: The asserted claims are not eligible for patenting under 35 U.S.C. § 101. Any other outcome would lead to severe and unwarranted disruption in the inventive community and the economy, including the foreign currency market.

ARGUMENT

As this Court has repeatedly made clear, "[l]aws of nature, natural phenomena, and abstract ideas are not patentable." *Ass'n for Molecular Pathology* v. *Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013) (quoting *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012)); *see also Bilski* v. *Kappos*, 130 S. Ct. 3218, 3225 (2010). In this contemporary trilogy of decisions, the Court built upon, and harmonized, a long series of earlier cases that established the framework for evaluating patent eligibility under 35 U.S.C. § 101. *See especially Diamond* v. *Diehr*, 450 U.S. 175, 185 (1981); *Diamond* v. *Chakrabarty*, 447 U.S. 303, 309 (1980); *Parker* v. *Flook*, 437 U.S. 584, 588–89 (1978); *Gottschalk* v. *Benson*, 409 U.S. 63, 67 (1972); *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948); *O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62, 113–17 (1854).

The claims asserted by Alice recite the fundamental economic practice of intermediated settlement or escrow, in which a "middleman" stands between the counterparties to a transaction and effectuates the transfer of entitlement once all conditions are satisfied. This is an "abstract idea" under *Bilski*, as both the district court (Pet. App. 214a) and a majority of the Federal Circuit (*id.* at 31a (opinion of Lourie, J.), 82a–84a (opinion of Rader, C.J.)) recognized. *See* Part I, *infra*. The plurality below (Pet. App. 29a–31a) also correctly determined that the asserted claims, while computer-implemented, lack an "inventive concept" that is a prerequisite to patent eligibility under the methodology prescribed by this Court in *Mayo*. *See* Part II, *infra*. Alice's bid for reversal would thus require the Court to critically undermine, if not overrule, both *Bilski* and *Mayo*. Doing so would harm innovation and the economy. *See* Part III, *infra*.[1]

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[1] The patentability of "software" is not presented in this case. *Cf. Bilski*, 130 S. Ct. at 3228 (plurality opinion); *Flook*, 437 U.S. at 595 & n.19. Alice's patents are not software patents—they do not explain *how* to configure a computer to perform the claimed methods. *See* Pet. App. 227a n.21. The functions recited in the asserted claims, such as receiving transactions, adjusting shadow accounts, and issuing payment instructions

I. ALICE'S CLAIMS RECITE AN ABSTRACT IDEA UNDER *BILSKI*

Section 101 of the Patent Act "defines the subject matter that may be patented" subject to the limitations of the Constitution. *Bilski*, 130 S. Ct. at 3225.

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101.

This Court has "long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." *Myriad*, 133 S. Ct. at 2116 (punctuation omitted). Thus, it does not suffice for patent eligibility that under "a purely literal reading of § 101" (*Flook*, 437 U.S. at 589) a claim is facially drawn to a "process" (*see*, *e.g.*, *Bilski*, 130 S. Ct. at

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[Footnote continued from previous page]

(Pet. Br. 7, 9), are simply the steps of a business method for third-party intermediation. Although Alice now says that "the specification lays out how to program a computer system to perform these functions" (Pet. Br. 53), it cites only Figures 25 and 33–37, which illustrate certain steps of the method but disclose no programming. *See* J.A. 1023, 1031–35. Nowhere do these patents claim or disclose the inputs, actions, and outputs of the software, hardware, and firmware components of a computational system, much less how those operations would be carried out through computer code, programming instructions, or logic flows to perform the claimed method. *See* Feldman Br. 26–27.

3223–24) or a "machine," "manufacture," or other "composition of matter" (*see*, *e.g.*, *Myriad*, 133 S. Ct. at 2113). It will nonetheless be ineligible if it claims a "law[] of nature, physical phenomen[on]," or "abstract idea[]" without other significant limitations. *Bilski*, 130 S. Ct. at 3225.

The claims at issue, though formally drawn to statutory subject matter, fall squarely within that exception—which has "defined the reach of the statute as a matter of statutory *stare decisis* going back 150 years." *Bilski*, 130 S. Ct. at 3225. Section 101, as construed by this Court, performs a "screening function" (*Mayo*, 132 S. Ct. at 1303) that is an important "threshold test" for patentability. *Bilski*, 130 S. Ct. at 3225; *see also*, *e.g.*, Retailers Br. 6–10. Alice's patents fail that test.[2]

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[2] Alice argues that the requirements of 35 U.S.C. §§ 102, 103, & 112 are sufficient to "ensur[e] that claims to computer-implemented inventions are not so broad or vague that they grant unjustified monopolies over entire fields of endeavor." Pet. Br. 42. In *Mayo*, the government similarly argued that "other statutory provisions"—particularly Sections 102, 103, and 112—"can perform this screening function." 132 S. Ct. at 1303. The Court rejected that approach, "recogniz[ing]" that "the § 101 patent-eligibility inquiry ... might sometimes overlap" with the later sections, but explaining that those sections "are not equipped to do" the "work" of Section 101. *Id.* at 1304. The Court should once again reject attempts to render the established "exception to § 101 patentability a dead letter." *Id.* at 1303; *see Bilski*, 130 S. Ct. at 3225; *Flook*, 437 U.S. at 593.

A. Abstract Ideas Include Fundamental Economic Principles

1. "An idea of itself is not patentable." *Rubber-Tip Pencil Co.* v. *Howard*, 87 U.S. (20 Wall.) 498, 507 (1874). As the Court long ago explained, a "principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Le Roy* v. *Tatham*, 55 U.S. (14 How.) 156, 175 (1853). These foundational pronouncements have served as this Court's Section 101 guideposts up to the modern day. *See, e.g.*, *Bilski*, 130 S. Ct. at 3230.

Thus, for more than 150 years, the Court has recognized and applied the rule that the Patent Act contains "no authority to grant a patent for a '*principle*' or a 'mode of operation,' or an *idea*, or *any other abstraction*." *Burr* v. *Duryee*, 68 U.S. (1 Wall.) 531, 570 (1864) (emphases added). The Court has not endeavored to "define further" the scope of this exception, relying instead on its "precedents on the unpatentability of abstract ideas." *Bilski*, 130 S. Ct. at 3231.

Accordingly, the Court has applied a common-law approach to questions of patent eligibility, analyzing particular claims by reasoning from its precedents in view of the language and purpose of the Constitution's Progress Clause and the Patent Act. *See, e.g.*, *Mayo*, 132 S. Ct. at 1299 ("The claim before us presents a case for patentability that is weaker than the (patent-eligible) claim in *Diehr* and no stronger than the (unpatentable) claim in *Flook*"); *Bilski*, 130 S. Ct. at 3229 ("Rather than adopting categorical rules that might have wide-ranging and unforeseen impacts, the Court resolves this case narrowly on the basis of this Court's decisions in *Benson*, *Flook*, and *Diehr*").

a. In the past half-century, the Court has decided four cases involving the eligibility of patent claims that recite abstract ideas. In *Benson*, the Court ruled that a computer-implemented algorithm for converting numbers in one form to another was a patent-ineligible abstract idea. 409 U.S. at 67–68. In *Flook*, the Court found, based on *Benson*, that a claimed method that employed a computer-implemented algorithm to calculate an alarm limit was likewise patent-ineligible. 437 U.S. at 586, 594. *Diehr* held that a particular method of using the well-known Arrhenius equation to determine the cure time of rubber (450 U.S. at 177 & n.2, 184) was eligible: The applicant had added to the equation a technological advancement (measuring the temperature inside the rubber-curing press) that "the industry ha[d] not been able to" achieve previously. *Id.* at 178 & n.3. And *Bilski*, the Court's most recent decision on abstract ideas, held that "the concept of hedging risk" was ineligible because "[h]edging is a fundamental economic practice long prevalent in our system of commerce." 130 S. Ct. at 3229, 3231.

As these cases establish, abstract ideas are not patentable because—just like laws of nature and natural phenomena—"they are the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67–68. Exclusive use of these building blocks would "foreclose[] more future invention than the underlying discovery could reasonably justify." *Mayo*, 132 S. Ct. 1301–03. So they must remain "part of the storehouse of knowledge of all men … free to all men and reserved exclusively to none." *Bilski*, 130 S. Ct. at 3225 (quoting *Funk Bros.*, 333

U.S. at 130). "[N]o one can claim" an "exclusive right" to such fundamental principles. *Le Roy*, 55 U.S. at 175.

"[M]onopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it." *Mayo*, 132 S. Ct. at 1293. The historical exception to Section 101, a "limitation consistent with the statutory text" (*Bilski*, 130 S. Ct. at 3229 (plurality opinion)), thus enforces the constitutional limit on governmental actions that "enlarge the patent monopoly without regard to the innovation ... gained thereby" or "restrict free access to materials already available." *Graham* v. *John Deere Co.*, 383 U.S. 1, 6 (1966).[3]

As the Court explained in *Mayo*, the prohibition on patenting natural laws, physical phenomena, and abstract ideas is "a somewhat more easily administered proxy for the underlying 'building-block' concern"—*i.e.*, the concern that patents not "foreclose[]" too "much future innovation" "relative to the contribution of the inventor." 132 S. Ct. at 1303.

Morse provides an early example of the foreclosure concern. *See Mayo*, 132 S. Ct. at 1300. There, the Court sustained several claims that recited particular applications of the use of electro-magnetic signals for telegraphic communication, but declared ineligible a claim on "electro-magnetism, however developed for marking or printing intelligible characters." *Morse*, 56 U.S. at 112 (internal quotation marks omitted). *Morse* thus held that an inventor may not patent a "principle." *Flook*, 437 U.S. at 592; *see also Mayo*, 132 S. Ct. at 1301–02 (explaining that "the grant of patents that tie up" such building blocks "will inhibit future innovation premised upon them").

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[3] The Progress Clause is both a "grant" of and "limitation" on Congress's power. *Graham*, 383 U.S. at 5. The Legislature may not "authorize the issuance of patents whose effects are to remove existent knowledge from the public domain." *Id.* at 6. Concomitantly, the Executive (through the Patent and Trademark Office) may not issue such a patent. *See ibid.* The Judiciary's power and obligation is to police both applications and issued patents in order to ensure that they do not transgress this core limitation. *Ibid.*; *see also, e.g.*, *Brenner* v. *Manson*, 383 U.S. 519, 534–35 (1966).

Because the same concern animates all three aspects of the Court's tripartite exception for natural laws, phenomena of nature, and abstract ideas, the Court treats them as "equivalent." *Mayo*, 132 S. Ct. at 1293, 1298. Regardless of what kind of principle is at issue, the key point is that the patent system cannot withdraw from public use the building blocks of innovation and advancement in the useful arts. *Id.* at 1303.

b. The Court has already held that the prohibition on patenting abstract ideas is fully applicable to the building blocks of economics. The claims at issue in *Bilski* "described" in a series of steps "the basic concept of hedging, or protecting against risk." 130 S. Ct. at 3231. The Court explained that "[h]edging is a fundamental economic practice" and therefore "an unpatentable abstract idea." *Ibid.* This common-sense proposition did not require extensive discussion or debate: "[A]ll members of the Court agree[d]" that Bilski's claims involved "an abstract idea." *Id.* at 3230; *see also id.* at 3235 (Stevens, J., concurring in the judgment); *id.* at 3258 (Breyer, J., concurring in the judgment).

In revising its guidelines for patent examiners in the wake of *Bilski*, the PTO recognized that the presence in a patent claim of a "general concept," including an economic concept, is an important indicator that the claim is drawn to an abstract idea. Manual of Patent Examining Procedure (MPEP) § 2106.II.B.1(d)(f) (8th ed. Rev. 9, Aug. 2012); *see also* Memorandum: Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of *Bilski* v. *Kappos* from Robert W. Bahr, Acting Assoc. Comm'r for Patent Examination Policy, to Patent Examining Corps (July 27, 2010). The PTO went on to explain, echoing the core holding of *Bilski*, that "[e]xamples of general concepts include … [b]asic economic practices or theories (e.g., hedging, insurance, financial transactions, marketing)." MPEP § 2106.II.B.1(d)(f).[4]

The economic concept of intermediated settlement is an abstract idea under the approach taken in *Bilski* and subsequently endorsed by the PTO.

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[4] The plurality below used the term "disembodied concept" as a synonym for "abstract idea." Pet. App. 28a (internal quotation marks omitted); *see also* MPEP § 2106.II ("In addition to the term[] … abstract ideas, judicially recognized exceptions have been described using various other terms, including … disembodied concepts"). Alice suggests that a truly incorporeal principle would be non-statutory. Pet. Br. 27–28; *cf. Microsoft Corp.* v. *AT&T Corp.*, 550 U.S. 437, 449 (2007) ("Abstract software code is an idea without physical embodiment"). Because that issue is not presented by the asserted claims, we will use the term "abstract idea." Alice's suggestion that this term has only "two … meanings"—*viz.*, "disembodied concepts" as distinguished from "fundamental truths" (Pet. Br. 29)—presents a false dichotomy.

2. Alice's effort to avoid the fatal import of *Bilski* turns on its contention that the abstract idea doctrine has no force unless "the claims recite a mathematical formula, a 'fundamental economic practice' that can be 'reduced to a mathematical formula,' or any other form of fundamental truth that 'exists in principle apart from any human action.'" Pet. Br. 44 (internal citations omitted). Alice's proposed redefinition cannot be squared with this Court's precedents.

a. Fidelity to *Bilski* requires rejecting Alice's effort to redefine the abstract idea doctrine. Indeed, under the approach now advocated by Alice, *Bilski* would have come out the other way: The broadest claim in Bilski's application—independent claim 1—involved no mathematical formula or principle that exists apart from human action, yet the Court held it ineligible.

The method recited in Bilski's independent claim 1 involved a series of three steps, none of which was formulaic: taking a risk position, identifying a counter position, and balancing the two positions. *Bilski*, 130 S. Ct. at 3223–24. The Court held this claim ineligible because it "described" the "fundamental economic practice" of hedging risk. *Id.* at 3231. Since claim 1 neither included nor depended upon any mathematical formula, the holding of *Bilski* destroys Alice's effort to conflate "abstract ideas" with "mathematical formulas."

Contrary to Alice's repeated assertion, Bilski's dependent claim 4—a narrowed variant of claim 1—did not reduce the entire method to a mathematical formula. *See, e.g.*, Pet. Br. 16. Rather, the formula of claim 4 provided only one way of calculating certain inputs for the method of hedging described in independent claim 1. *See Bilski* J.A. 19–20. Claim 4 and the other "remaining claims" were ineligible not because they included a formula, but because they added mere "token" limitations to the abstract idea of risk hedging recited in the broader independent claim 1. 130 S. Ct. at 3231.

Moreover, the concept of hedging in *Bilski* did not exist "apart from any human action." Pet. Br. 26. Hedging has been "long prevalent in our system of commerce" (*Bilski*, 130 S. Ct. at 3231) but it does not "preexist[]" humankind, as Alice apparently would require (Pet. Br. 22). The sole basis for monetary hedging is financial uncertainty, a peculiarly human condition. *See Bilski*, 130 S. Ct. at 3223–24. So, too, for intermediated settlement.

The PTO's post-*Bilski* guidelines, likewise, describe a number of other clearly human actions as abstract ideas. These include "[b]asic legal theories," "[i]nterpersonal interactions or relationships," "[t]eaching concepts," "[h]uman behavior," and "[i]nstructing 'how business should be conducted.'" MPEP § 2106.II.B.1(d)(f). None of these would fit into Alice's rigid taxonomy of mathematical formulas or fundamental truths. Alice's newly minted approach to abstract ideas cannot be reconciled with the PTO's guidance, which, in turn, is based on *Bilski*. That is undoubtedly why Alice's brief does not even mention this post-*Bilski* guidance.

b. Alice relies heavily on the fact that mathematical formulas were at issue in *Benson* and *Flook*. Pet. Br. 24–25. But the Court held the claims in those cases ineligible not because they included mathematical formulas but because their "algorithms"—which the Court defined as "procedure[s] for solving a given type of mathematical problem"

(*Benson*, 409 U.S. at 65; *Flook*, 437 U.S. at 585 n.1)—qualified as building blocks of future innovation. If patented, they would have broadly preempted use of the underlying ideas.

Although an algorithm is indeed a "process" (*Flook*, 437 U.S. at 588–89), it will nonetheless be ineligible if it is "abstract and sweeping" (*Benson*, 409 U.S. at 68). $E=mc^2$ is patent-ineligible because it is a building block, not because it is expressed using symbols. Feldman Br. 6–7; *Chakrabarty*, 447 U.S. at 309. Einstein's principle would be equally ineligible if written as: "Use a quantity of matter to obtain an amount of energy equal to the matter's mass times the square of the speed of light." *See Mayo*, 132 S. Ct. at 1297. Such a claim is ineligible because it claims "a scientific truth," not due to "the mathematical expression of it." *MacKay Radio & Tel. Co.* v. *Radio Corp. of Am.*, 306 U.S. 86, 94 (1939).

This Court has never suggested that mathematical formulas possess talismanic significance in the abstract idea inquiry. *See Rubber-Tip Pencil*, 87 U.S. at 507 (rejecting an apparatus patent because the Court found nothing unconventional added to "the idea that if a pencil is inserted into a cavity in a piece of rubber smaller than itself the rubber will attach itself to the pencil, and when so attached become convenient for use as an eraser"). Although the Court has found certain claims containing mathematical formulas ineligible (*Flook*, 437 U.S. at 595), it has never said that ineligible abstract ideas are *limited* to mathematical formulas. In fact, it has spoken in far broader terms when describing patent-ineligible principles. *See, e.g.*, *Benson*, 409 U.S. at 67 (explaining that abstract ideas include "mental processes and abstract intellectual concepts") (punctuation omitted); *Burr*, 68 U.S. at 570; *Le Roy*, 55 U.S. at 175.

It could hardly be otherwise, for mathematics is merely a specialized language for describing other things. Mathematical formulas express or explain *relationships* between concepts, events, or observations; they are not in themselves "fundamental truths," as Alice erroneously suggests. Pet. Br. 22–23. And because math is a language like any other, virtually any process—including each step of Alice's method—can be rewritten in mathematical notation. Feldman Br. 6–9; Alan M. Turing, *Computability & λ-Definability*, 2 J. Symbolic Logic 153 (1937) (any method can be expressed as a mathematical algorithm).

Mathematical formulas neither secure nor preclude eligibility, for a "mathematical formula may describe a law of nature, a scientific truth, or an abstract idea. As courts have recognized, mathematics may also be used to describe steps of a statutory method or elements of a statutory apparatus." *Arrhythmia Research Tech.* v. *Corazonix Corp.*, 958 F.2d 1053, 1056 (Fed. Cir. 1992). Accordingly, both this Court and the Federal Circuit have held that some patents that contain formulas are eligible. *See, e.g.*, *Diehr*, 450 U.S. at 187; *Research Corp. Techs.* v. *Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir. 2010); *SiRF Tech., Inc.* v. *Int'l Trade Comm'n*, 601 F.3d 1319, 1323 (Fed. Cir. 2010). Concomitantly, some patents that do not contain formulas are ineligible. Bilski's claim 1 amply demonstrates this, as do numerous Federal Circuit decisions rejecting patents to non-mathematical abstract ideas (including business methods like Alice's) as ineligible under *Bilski*. *See, e.g.*, *Accenture Global Servs., GmbH* v. *Guide-*

wire Software, Inc., 728 F.3d 1336, 1344 (Fed. Cir. 2013), *petition for cert. filed*, No. 13-918 (Jan. 31, 2014); *Bancorp Servs.* v. *Sun Life Assur. Co. of Can.*, 687 F.3d 1266, 1278 (Fed. Cir. 2012), *petition for cert. filed*, No. 13-584 (Nov. 8, 2013); *Fort Props., Inc.* v. *Am. Master Lease LLC*, 671 F.3d 1317, 1322 (Fed. Cir. 2012); *Dealertrack, Inc.* v. *Huber*, 674 F.3d 1315, 1333–34 (Fed. Cir. 2012); *CyberSource Corp.* v. *Retail Decisions, Inc.*, 654 F.3d 1366, 1371–72 (Fed. Cir. 2011).

c. Alice also tries a different tack, arguing that "this Court has used the term ['abstract idea'] as a synonym for a fundamental truth." Pet. Br. 22. The only case it cites is *Diehr*, which said no such thing. Three sitting Justices have in fact said the opposite: A patent may be ineligible for claiming an "abstract idea" even if it does *not* claim a "fundamental truth." *Bilski*, 130 S. Ct. at 3235 (Stevens, J., joined by Ginsburg, Breyer, and Sotomayor, JJ., concurring in the judgment). Even Alice's friends do not agree with it on this point. *See* TTI Br. 20 (*Bilski* "can also be read as applying that exception beyond the narrow realm of such truths").

Alice gives the game away when it says that Bilski's claim 1 described the "fundamental … truth" that "risk from one fixed price transaction can be avoided by engaging in an offsetting fixed price transaction." Pet. Br. 26. If that method of mitigating risk is a "fundamental truth," then so too is the principle that the risk of one party's non-payment at settlement can be mitigated by designating an intermediary to ensure mutual compliance before directing the transfer of entitlement—the basic concept that Alice's claims address.

In short, an abstract idea is a building block of technology (*Benson*, 409 U.S. at 67), of innovation (*Flook*, 437 U.S. at 594–95), and of the economy (*Bilski*, 130 S. Ct. at 3231). Such a principle may not be patented because it would impede progress, not because it is notated in symbols instead of words. *Mayo*, 132 S. Ct. at 1303. Contrary to Alice's attempted redefinition, patent-ineligible abstract ideas simply are not limited to mathematical formulas. And Alice has no other basis to get out from under *Bilski*.

B. Alice's Patents Claim The Fundamental Economic Principle Of Intermediated Settlement

Alice's claims recite the basic principle of intermediated settlement, a building block of economics and risk management just like the concept of hedging in *Bilski*. Because hedging is a "fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class," this Court held unanimously that claims "describ[ing]" a particular form of that concept were not patent-eligible. *Bilski*, 130 S. Ct. at 3231. The concept of mitigating settlement risk through intermediation is likewise fundamental and ancient, and Alice's claims merely "describe[]" it.[5]

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[5] Alice's claims were prosecuted and allowed by the PTO before *Bilski*, based on examination guidelines that have since been superseded. Therefore, the district court properly undertook a *de novo*, post-*Bilski* determination of the eligibility question and found these patents wanting. Pet. App. 172a–238a. Contrary to Alice's unsupported assertion (Pet. Br. 43), patents are not "presumed" eligible. Section 101 challenges are

1. Both the district court (Pet. App. 215a) and a clear majority of the en banc Federal Circuit (*id.* at 28a–34a (opinion of Lourie, J.), 82a–84a (opinion of Rader, C.J.)) correctly concluded that Alice's patents rest on an abstract idea.

a. Alice does not deny that the asserted claims recite the concept of an intermediated settlement arrangement. In fact, in this Court, Alice expressly states that the claims "recite an electronic intermediary 'supervisory institution' that facilitates settlement between the parties to an executory transaction." Pet. Br. 4. In the Federal Circuit, Alice similarly explained: "The point of Alice's invention is for a computer system itself to stand between two parties to a transaction and then effect the exchange." Alice Supp. C.A. Br. 36. Or, as Alice put it to the district court, its patents claim an arrangement where a "trusted third party ... operates a data processing system that exchanges both parties' obligations." Pet. App. 174a (quoting Alice's motion for summary judgment). Precisely so. Alice claims,

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decided by the reviewing court before it turns to the defenses authorized by 35 U.S.C. § 282, and thus the presumption of validity "has no application." *Microsoft Corp.* v. *i4i Ltd. P'ship*, 131 S. Ct. 2238, 2253 (2011) (Breyer, J., concurring). Indeed, *Myriad* and *Mayo* both involved issued patents, and the Court applied no such presumption. Moreover, the "rationale underlying the presumption" (*KSR Int'l Co.* v. *Teleflex Inc.*, 550 U.S. 398, 426 (2007)) does not hold in this case because the PTO applied a concededly incorrect legal standard in examining the patents-in-suit. U.S. C.A. Br. 1, 4. In any event, the clear and convincing evidence in the summary judgment record establishes that the asserted claims are ineligible, and thus any applicable presumption has been overcome.

in sum and substance, a computerized "financial intermediary." *See Oxford English Dictionary* 1115–16 (2d ed. 1989) (an intermediary is "a go-between middleman" used by parties to a transaction).

This concept of intermediated settlement is, as Judge Prost noted in her panel dissent below, "literally ancient." Pet. App. 163a; *see*, *e.g.*, Randall S. Kroszner, *Commentary*, Fed. Reserve Bank of St. Louis Rev., May/June 1998, at 117, 119 ("private clearing and settlement arrangements" have existed since at least "the nineteenth and early twentieth centuries"); Edward J. Green, *Clearing and Settling Financial Transactions, Circa 2000*, *in* Challenges for Central Banking 115, 127 (Anthony M. Santomero et al. eds., 2001) (use of a clearing house that holds collateral in escrow is one of the "classic examples of general risk-management technique"); Peter Temin, *Financial Intermediation in the Early Roman Empire*, 64 J. Econ. Hist. 705 (2004) (comparing history of financial intermediation in ancient times to modern practices).

Intermediated settlement is often referred to as an "escrow" arrangement, and common definitions of this age-old practice track Alice's claimed method. *See*, *e.g.*, *Black's Law Dictionary* 624 (9th ed. 2009) (describing escrow as a "security device" where "one or both parties to a transaction deposit property or an instrument with a third party until some condition has occurred" (quoting Restatement (Second) of Contracts § 103 cmt. a (1979))); Glenn G. Munn, *Encyclopedia of Banking and Finance* 296 (F.L. Garcia ed., 8th ed. 1983).

Accordingly, both of the lower courts correctly concluded, on an undisputed record, that the method of intermediated settlement claimed by Alice constitutes "a form of escrow." Pet. App. 28a (opinion of Lourie, J.); *see also id.* at 30a, 34a (Lourie, J., noting that Alice claims "an escrow arrangement" or "a method of escrow"); *id.* at 82a, 83a, 84a (Rader, C.J., explaining that Alice claims "an escrow arrangement" and recites steps "inherent in the concept of an escrow" or "long used in escrows"); *id.* at 215a (district court finding that Alice's patents are "directed to the abstract and fundamental concept of using an intermediary to guarantee an exchange").

b. No coherent line can be drawn to distinguish Alice's method from Bilski's. *See* Pet. App. 31a (opinion of Lourie, J.) (observing that Alice's claims "closely resemble those in *Bilski*, which also explained a 'basic concept of ... protecting against risk'") (citation omitted); *id.* at 84a (opinion of Rader, C.J.) ("Viewed as a whole, the claim is indistinguishable from the claim in *Bilski*").

A side-by-side comparison of Alice's representative method claim with Bilski's illustrates this point:

Bilski claim 1	Alice claim '479:33
"(a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumers; (b) identifying market participants for said commodity having a counter-risk position to said consumers; and (c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions."	"(a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institution; (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record; (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these [sic] transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and (d) at the end-of-day, the supervisory institution instructing ones [sic] of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions."

2. Although Alice and its *amici* devote many pages to discussing the general contours of the abstract idea doctrine, they say precious little about the actual claims at issue here. *See only* Pet. Br. 43–53; ABL Br. 35–38; IEEE Br. 22–24; SSBG Br. 21–22. And what they do say fails to establish the eligibility of those claims under Section 101.

a. Alice suggests that its claims do not meet its chosen dictionary's definition of escrow because they "do not *prescribe* that the electronic intermediary (or any other third party) receives any money or property." Pet. Br. 47 (emphasis added). Of course, Alice's claims do not *preclude* the receipt of money or property and thus would cover such activity. In any event, nothing in the concept of intermediated settlement requires the physical exchange of money or tangible property.

A critical feature of escrow and other forms of intermediated settlement is that transfer of entitlement does not take place "until the fulfillment of the condition." *Webster's New International Dictionary* 872 (2d ed. 1949); *accord* American Bankers Association, *Banking Terminology* 104 (1981) (in escrow, property is "delivered on a certain contingency or on the occurrence of a certain event"). Moreover, most financial instruments are traded today using "notional" (or, in Alice's terminology, "shadow") accounts rather than the underlying property. *See* Mark Rubinstein, *Rubinstein on Derivatives* 1–3, 394 (1999). Alice's method fits easily within these parameters.

b. Alice also contends that the asserted claims do not monopolize the entire concept of intermediated settlement, just "specific *ways* of accomplishing third-party intermediation." Pet. Br. 49. To that end, Alice hypothesizes—for the first time in this Court—several alternatives for specific limitations that appear in some but not all of its claims. *Id.* at 49–50.

It is conceivable that a "differently designed system" (Pet. Br. 49) could avoid direct infringement of at least some of the asserted claims. But a patent need not foreclose every conceivable application of an abstract idea to be ineligible. After all, there were many ways of hedging risk not claimed by Bilski: Even his broadest claim covered only situations where customers purchase commodities "at a fixed rate based upon historical averages" (130 S. Ct. at 3223–24), and some of the dependent claims were narrower still (*Bilski* J.A. 19–22). But that did not stop the Court from declaring each of his claims ineligible. 130 S. Ct. at 3231.

As the Court has explained, "the underlying functional concern here is a *relative* one: how much future innovation is foreclosed relative to the contribution of the inventor." *Mayo*, 132 S. Ct. at 1303. Even a narrow law of nature or abstract idea is ineligible because patenting such principles still "inhibit[s] future" development—and in return the patentee contributes a "creative value" that is "considerably smaller." *Ibid.* Broad or narrow, a patent that "forecloses more future invention than the underlying discovery could reasonably justify" (*id.* at 1301) impedes progress, rather than promotes it.

The alternatives tossed up by Alice relate to details, such as adjusting the tracking accounts "based on the size rather than timing of the transactions" or "only at specified times rather than for every transaction." Pet. Br. 50. Many of the independent claims (including representative claim 33) literally cover a single transaction, rendering such details irrelevant.

Even taking into account such details, the asserted claims would foreclose, or at minimum implicate, intermediated transactions in most sectors of the economy. At least one of Alice's proposed alternatives—transactional as distinguished from periodic settlement—proves this point, as these are the two principal ways that intermediated settlement is performed in the real world. *See* Part II.B.1.d, *infra*.

The district court recognized the breathtaking sweep of the asserted claims. "The abstract idea claimed by Alice's methods ... [would] effectively preempt the use of an electronic intermediary to guarantee exchanges across an incredible swath of the economic sector." Pet. App. 218a; *see also id.* at 219a ("If patentable, these claims could preempt the use of an electronic intermediary, using a shadow credit and/or debit records, as a manner in which to exchange an infinite array of tangible and intangible representations of value"). The plurality too found that Alice's "broad" "claims to methods of financial intermediation 'would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.'" *Id.* at 31a (quoting *Bilski*, 130 S. Ct. at 3231). Alice does not challenge (indeed, it does not even mention) these conclusions, which are unaffected by the possibility that there may be other "ways" of effectuating an intermediated settlement.

Thus, even assuming that the asserted claims are "narrower" than *all* instances of intermediated settlement (Pet. Br. 50), that does not mean they are patent-eligible. This Court made clear in *Mayo* that even a "narrow and specific" law of nature—and, equivalently, abstract idea—may be ineligible for patenting. 132 S. Ct. at 1302–03. For that reason, the potential availability of alternatives does not allow Alice to claim an abstract idea. *Diehr*, 450 U.S. at 192 n.14.

Alice's claims, just like those rejected in *Bilski*, cover "a fundamental economic practice" designed for "protecting against risk." 130 S. Ct. at 3231. Like Bilski's, they "can be rejected under [this Court's] precedents on the unpatentability of abstract ideas." *Ibid.*

II. ALICE'S CLAIMS DO NOT ADD "SIGNIFICANTLY MORE" UNDER *MAYO*

"[T]he Court's precedents ... insist" that a claim "that focuses upon the use of a natural law [or other fundamental principle] also contain other elements or a combination of elements, sometimes referred to as an 'inventive concept.'" *Mayo*, 132 S. Ct. at 1294 (quoting *Flook*, 437 U.S. at 594); *see Quanta Computer, Inc.* v. *LG Elecs., Inc.*, 553 U.S. 617, 635 (2008) (referring to the "inventive aspect" of a patent). Just last Term, this Court confirmed that a claim is not eligible if the patentee "did not create anything." *Myriad*, 133 S. Ct. at 2117. Even if what an issued patent claims and discloses is "important and useful," there must be "an act of invention." *Ibid.* The claims asserted by Alice add no inventive concept to the abstract idea of intermediated settlement.

A. A Computer Used For Its Routine Functions Is A Conventional Element

1. The *Mayo* Court used the word "inventive" (132 S. Ct. at 1294, 1299, 1300) as shorthand for the requirement that a claim contain elements that "in terms of patent law's objectives ha[ve] significance"

(*id.* at 1299). Mere "well-understood, routine, conventional activity" (*ibid.*) does not serve these objectives, for it is not "new and useful," as Section 101 demands. *See Bilski*, 130 S. Ct. at 3225 (the eligibility exception is "consistent with the notion that a patentable process must be 'new and useful'").

To permit patents on claims reciting an abstract idea and only conventional steps would "inhibit further discovery by improperly tying up the future use" of foundational building blocks in innovation while contributing very little to the development of those inventions. *Mayo*, 132 S. Ct. at 1301; *accord* Mark A. Lemley et al., *Life After* Bilski, 63 Stan. L. Rev. 1315, 1317 (2011) (cited thrice in *Mayo*) ("what really matters" in the Section 101 analysis is "whether the scope of the patentee's claims is commensurate with the invention's practical, real-world contribution").

To ensure that a claim based on an abstract idea provides "an inventive application" of that idea (132 S. Ct. at 1299), *Mayo* articulates a particular methodology for applying Section 101. Under *Mayo*, a court identifies the abstract idea and then asks: "What else is there in the claim[] before us?" *Id.* at 1297. To answer that question, the Court examines each element of the claim beyond the abstract idea—first individually and then "as an ordered combination"—to determine if it is "sufficient to transform the nature of the claim." *Id.* at 1297–98.[6]

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[6] As Alice notes (Pet. Br. 30-32), *Diehr* prohibits dissecting the claims into old and new elements and then *ignoring claim elements* upon determining that they are non-novel. 450 U.S. at 188. The approach articulated in *Mayo*—which this Court

In this analysis, mere "well-understood, routine, conventional activity previously engaged in by" the industry is not "*enough*." *Mayo*, 132 S. Ct. at 1294, 1297. Thus, in *Mayo*, reciting "well known" methods of determining metabolite levels did not "transform" the natural law into an eligible patent claim. *Id.* at 1298. Reciting "steps that must be taken" to apply an abstract idea is also insufficient. *Id.* at 1299. "[P]ost-solution activity" and "pre-solution activity," including "gather[ing] data," do not confer eligibility either. *Id.* at 1298 (punctuation omitted). Nor does it suffice to "narrow" the principle at issue, or "limit" it "to one field of use" or "to a particular technological environment." *Id.* at 1297, 1300–01, 1303; *Bilski*, 130 S. Ct. at 3230–31 (citation omitted). None of these "additional features" adequately "provide[s] practical assurance that the process is more than a drafting effort designed to monopolize" the abstract idea. *Mayo*, 132 S. Ct. at 1297.

This methodology was central to *Mayo*'s holding. Yet, Alice simply whistles past the requirement that a patent drawn to an abstract idea must *also* contain

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carefully squared with *Diehr*—focuses attention on *all* claim elements, asking whether individually or "as a whole" they are "sufficient to transform the nature of the claim." 132 S. Ct. at 1294, 1297–98; *see also Flook*, 437 U.S. at 594 (such an approach is "not at all inconsistent with the view that a patent claim must be considered as a whole"). This methodology has analogues in other areas of patent law, such as whether an accused infringer has performed all elements of a claim (*see Warner-Jenkinson Co.* v. *Hilton Davis Chem. Co.*, 520 U.S. 17, 29, 40 (1997)) or whether a claim is anticipated in the prior art (*see, e.g.*, *Net MoneyIN, Inc.* v. *VeriSign, Inc.*, 545 F.3d 1359, 1370–71 (Fed. Cir. 2008)).

"enough" other elements—and that conventional activity is not enough—even though this Court repeated it *nine times*. *Mayo*, 132 S. Ct. at 1294, 1298, 1299, 1300, 1302. Thus, while Alice purports to disagree with Judge Lourie's opinion for five members of the court below (Pet. Br. 32–33, 51–52), its real disagreement is with Justice Breyer's opinion for nine Members of *this* Court. *Mayo* fully answers Alice's methodological objections.[7]

2. This Court has long held that "simply implementing" an abstract idea "on a physical machine, namely a computer, [i]s not a patentable application of that" idea. *Mayo*, 132 S. Ct. at 1301 (citing *Benson*, 409 U.S. at 64); *see also Flook*, 437 U.S. at 593–94. This stands to reason: A computer, like any other utensil of the relevant art (be it a hammer to the carpenter, a sextant to the navigator, or a syringe to the doctor), neither adds to nor subtracts from eligibility when used conventionally. Such conventional use simply limits the claim "to a particular technological environment." *Bilski*, 130 S. Ct. at 3230 (quoting *Diehr*, 450 U.S. at 191).

In *Benson*, this Court evaluated a patent that claimed an abstract idea, implemented in "general-purpose digital computer[s]." 409 U.S. at 64. Because the claim was drawn to an abstract idea—there, an algorithm for converting binary-coded decimal numbers to pure binary numbers—the inventive concept had to come from "the application" of the idea. *Id.* at 65–67. But the computer implementation added nothing inventive, for the process could be "carried out in existing computers long in use, no new machinery being necessary." *Id.* at 67. Indeed, it could "also be performed without a computer" (*ibid.*), even though one claim was limited to performance on a common computer element of the day (a "reentrant shift register") (*id.* at 73). The method therefore was not patent-eligible. *Id.* at 71–73.

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[7] The division within the Federal Circuit was driven by a difference of opinion between Judge Lourie and Chief Judge Rader on whether and how *Mayo* applies to computer-implemented claims. *Compare* Pet. App. 20a–41a (opinion of Lourie, J.), *with id.* at 64a–65a (opinion of Rader, C.J.) *and* 128a–31a ("[a]dditional reflections" of Rader, C.J.); *compare also, e.g.*, *Ultramercial, Inc.* v. *Hulu, LLC*, 722 F.3d 1335, 1348 (Fed. Cir.) (opinion of Rader, C.J.), *petition for cert. filed*, No. 13-255 (Aug. 23, 2013), *with id.* at 1354 (opinion of Lourie, J.).

Similarly, the Court in *Flook* rejected a claim that used a computer to perform calculations that could "be made by pencil and paper." 437 U.S. at 586. That function—"the use of computers for automatic monitoring-alarming"—was "well known." *Id.* at 594 (internal quotation marks omitted). It therefore provided no "inventive concept" to the "application" of a mathematical formula. *Ibid.* Even though computer implementation of the algorithm "provide[d] a new and presumably better method for calculating alarm limit values," it was still not patent-eligible. *Id.* at 594–95. That was because neither the computer nor any other element in the claim added anything "inventive" to the abstract idea. *Ibid.*

In *Diehr*, by contrast, the Court confronted a computer-implemented invention that satisfied Section 101's "inventive concept" requirement. *See Mayo*, 132 S. Ct. at 1298–99. In that case, the Court held eligible a computer-implemented process for curing rubber based on the combination of elements other than the algorithm. *Diehr*, 450 U.S. at 187. The process used a mathematical formula that was "well-known" (*ibid.*), but the other steps of the process added an inventive concept—an improvement to the existing technology. *See Mayo*, 132 S. Ct. at 1299.

The invention in *Diehr* required continual measurement of the temperature inside the press, something "the industry ha[d] not been able to" achieve before. 450 U.S. at 178 & n.3. That new use of a "thermocouple" to overcome a problem in "conventional industry practice"—not the "computations"—was Diehr's inventive contribution. *Id.* at 178 & n.3, 187. Diehr's additional steps, this Court recently explained, "added to the formula something that in terms of patent law's objectives had significance—they transformed the process into an inventive application of the formula." *Mayo*, 132 S. Ct. at 1299. Thus, the claims in *Diehr* were eligible because they contained an inventive technological improvement, not because the concept was implemented by a computer. *See also Dolbear* v. *Am. Bell Tel. Co.*, 126 U.S. 1, 534–35 (1888) (sustaining Alexander Graham Bell's claim on the telephone); IPO Br. 4.

Under these precedents, the question presented by Alice—"[w]hether claims to computer-implemented inventions ... are directed to patent-eligible subject matter" (Pet. Br. i)—can only be answered, "it depends." Some computer-implemented inventions will be patent-eligible, as in *Diehr*; others will be ineligible, as in *Benson* and *Flook*. The recitation of a computer (or computing functions) neither guarantees nor precludes eligibility. Rather, the ultimate issue is whether the particular claims asserted are eligible under the "well-established standard" articulated in this Court's precedents (*Myriad*, 133 S. Ct. at 2116)—chiefly, whether they add "significantly more" to an otherwise ineligible abstract idea (*Mayo*, 132 S. Ct. at 1294). Pet. App. 29a–31a, 36a–41a (opinion of Lourie, J.); *see also*, *e.g.*, *Bancorp*, 687 F.3d at 1279–80 (articulating a workable framework for evaluating computer-implemented inventions under *Mayo*).

3. Alice maintains that, because a computer "necessarily exist[s] in the physical, rather than purely conceptual, realm," a computer cannot *itself* be an abstract idea. Pet. Br. 39. There is no dispute that a programmed computer is a "machine" or that many computer-implemented claims, including Alice's, are formally drawn to statutory subject matter. It does not follow, however, that all such claims are automatically patent-eligible, as Alice implies and some of its *amici* expressly contend. *E.g.*, IBM Br. 5. Such an approach would blow a gaping hole in the judicial exception to Section 101: An applicant could write an eligible claim reciting "a computer system configured to" perform virtually any principle of the physical or social sciences, including economic concepts such as hedging and intermediated settlement.

The question is not whether a computer is tangible, but whether—in the context of the particular patent claims asserted by Alice—computer implementation adds enough to confer eligibility. The plurality below properly answered that question in the negative. Pet. App. 29a–30a, 37a–41a; *but see id.* at 69a–80a (Rader, C.J., dissenting on this point).

Mayo explained that "[i]f a law of nature is not patentable, then neither is a process reciting a law of nature, unless that process has additional features" that are not merely conventional. 132 S. Ct. at 1297; *accord Flook*, 437 U.S. at 588–89, 593. Thus, although a "particular process" may be patent-eligible even if it employs a fundamental principle (*Dolbear*, 126 U.S. at 535; *see Cochrane* v. *Deener*, 94 U.S. 780, 788 (1877)), the other steps of the method must add enough to ensure patentability. *See Flook*, 437 U.S. at 594.

Similarly, if an abstract idea is not patentable, then neither is an apparatus claim reciting that abstract idea, unless it contains an inventive concept. This Court has long recognized that a "machine"—like a process—cannot be claimed in terms of its "abstract effect." *Corning* v. *Burden*, 56 U.S. (15 How.) 252, 268 (1854). Hence, the precedents focus on the "practical effect" of granting a patent—in other words, what the patent "pre-empt[s]"—in determining whether it falls within the prohibition on "patent[ing] an idea." *Benson*, 409 U.S. at 71–72.

In this respect, the only real distinction between *Bilski* and this case is that the use of a computer in *Bilski* was implicit whereas here it is explicit. In *Bilski*, the applicant stated that "the practice of the invention will most likely involve both computers and modern telecommunications." *Bilski* Pet. Br. 7; *see also In re Bilski*, 545 F.3d 943, 996 (Fed. Cir. 2008) (en banc) (Newman, J., dissenting) ("any practicable embodiment would be conducted with the aid of a machine—a programmed computer"). This Court nonetheless held that, just as narrowing a claim to one "field of use" such as particular "markets" could not render the claim eligible, neither could narrowing it "to a particular technological environment." *Bilski*, 130 S. Ct. at 3230–31. Giving all computer-implemented inventions a categorical pass under Section 101 would thus require overruling or at least mortally wounding *Bilski*.

As a matter of law, making explicit the use of a computer in the claims in *Bilski*, or for that matter adding pedestrian use of a computer to perform the correlations in *Mayo*, would not have changed the results in those cases. In each of them, a computer could have been used—and in *Bilski* would in practice have been used—to improve the speed and accuracy of the claimed process. Such a limitation, however, would not have cabined the foreclosure effect of the claims in either *Bilski* or *Mayo*, or changed the eligibility determination in those cases. The same is true here, as we show next.

B. Alice's Claims Contain No Inventive Concept

Just as the ineligible claims in *Mayo* effectively stated a "law of nature while adding the words 'apply it'" (132 S. Ct. at 1294), Alice's claims effectively state an abstract idea while adding the words "compute it." *See* Pet. App. 39a–40a (opinion of Lourie, J.). That is not enough to confer eligibility on an otherwise ineligible claim.

1. Alice contends that its "claim limitations—including in particular those requiring computer implementation"—should save the asserted claims from ineligibility. Pet. Br. 48. Those limitations, however, add at most "well-understood, routine, conventional activity" to the abstract idea of financial intermediation, as an analysis of each step of the representative method claim and all the steps taken together demonstrates. *See Mayo*, 132 S. Ct. at 1298–99.

As recited in claim 33 of the '479 patent, Alice's "method of exchanging obligations as between parties" comprises the steps of (a) creating shadow records, (b) obtaining start-of-day balances for them based on real-world accounts, (c) adjusting the shadow records in chronological order based on transactions settled, and finally (d) sending irrevocable instructions to financial institutions to exchange debits and credits in real-world accounts at the end of the trading day to reflect the shadow records. J.A. 383–84.

a. The first step involves "creating a shadow credit record and a shadow debit record" for each counterparty to a transaction. J.A. 383. As "the record" of this case shows, "bookkeepers have long kept track of accounts in this fashion as a basic form of bookkeeping." Pet. App. 82a (opinion of Rader, C.J.) (citing Richard A. Brown, *A History of Accounting and Accountants* 93 (1905)). Alice does not contend otherwise.

"Shadow" or tracking accounts have been used in financial intermediation since at least the 1400s. Early banks used a "type of special deposit" involving "[f]unds ... deposited by an individual to the credit of a notary to be transferred by him to a designated party or parties as soon as certain stated conditions were complied with." 1 Abbott Payson Usher, *The Early History of Deposit Banking in Mediterranean Europe* 16 (1943). As with Alice's steps of obtaining start-of-day balances and instructing the real-world accounts to reflect the completed transactions, these medieval "[t]ransfers were made from the general ledger to the ledger of special deposits and ultimately back to the general ledger again." *Id.* at 16–17.

Using the "extravagant language" of "shadow" records makes no difference. Pet. App. 30a (opinion of Lourie, J.). New labels on old concepts are not the sort of invention that the patent system protects. *Mayo*, 132 S. Ct. at 1294; *see Flook*, 437 U.S. at 585 (in rejecting a "method of updating alarm limits," observing that "[a]n 'alarm limit' is a number"). In fact, the process struck down in *Bilski* relied on this type of notional accounting. *See Bilski*, 545 F.3d at 950 (describing how the claims did not require transfer of "actual commodities").

Accounting for debits and credits is "a basic function required of any financial intermediary in an escrow arrangement—tracking each party's obligations and performance." Pet. App. 30a (opinion of Lourie, J.). Far from distinguishing Alice's claims from escrow (Pet. Br. 47), this step is "inherent in the concept of an escrow." Pet. App. 82a (opinion of Rader, C.J.).

Using a computer to maintain these shadow accounts is "purely conventional." *Mayo*, 132 S. Ct. at 1299. Recordkeeping is one of a computer's most basic functions, supplanting the "pencil and paper" that a human being otherwise would use for that purpose. *See Flook*, 437 U.S. at 586. Any generic computer storage system would suffice for this purpose; as this Court recognized over four decades ago, a computer by its very nature uses "previously stored data." *Benson*, 409 U.S. at 65. Thus, the "creating" step does not add an "inventive concept" to the claimed method. *Cf. Mayo*, 132 S. Ct. at 1297 ("administering" step not inventive because doctors had performed it "long before anyone asserted these claims").

b. The second step involves "obtaining … a start-of-day balance for each shadow credit record and shadow debit record." J.A. 384. "This generalized step is also inherent in the concept of an escrow." Pet. App. 82a–83a (opinion of Rader, C.J.). Every financial account requires a starting place from which subsequent adjustments are made. *See Bilski*, 130 S. Ct. at 3231 (claim not inventive because establishing "inputs" for equation involved "well-known" techniques).

Moreover, the "obtaining" step involves only ordinary communication with banks or other financial institutions to establish the inputs for the accounts. But data-gathering adds "nothing of practical significance." Pet. App. 30a (opinion of Lourie, J.). There is nothing inventive about establishing an opening balance. *See Mayo*, 132 S. Ct. at 1297–98 ("determining" step not inventive because doctors "routinely measured" the relevant metabolites).

Deploying a computer's communications functions to obtain the initial values is conventional too. Computers are "routinely" used for automatic communications, as anyone who has received telephone solicitations or email notifications understands all too well. *Mayo*, 132 S. Ct. at 1298–99. Alice's claims do not require any particular method of communication via computer, instead leaving it to the intermediary to use "whatever process [it] wishes to use." *Id.* at 1297.

c. The third step involves "for every transaction … adjusting each respective party's shadow credit record or shadow debit record … in chronological order." J.A. 384. This "adjusting" step is part of the idea of escrow—*i.e.*, the notion that an intermediary will tally the counterparties' respective obligations and transfer entitlement when they have satisfied those obligations. Like "the 'wherein' clauses" of the claims in *Mayo*, the "adjusting" step "simply tell[s]" a practitioner about the abstract idea. 132 S. Ct. at 1297.

Adjusting accounts is entirely routine. Bankers, brokers, accountants, shopkeepers, and others who maintain books of account—including individuals who balance their checking accounts—routinely adjust balances over time to reflect transactions.

Making an adjustment only when both parties have "adequate value" for the transaction (Pet. Br. 7) ensures that both parties can perform the transaction before either party transfers its property, thus serving escrow's function as a "security device." Restatement (Second) of Contracts § 103 cmt. a (1979). Such a loose condition on the method is akin to the limitation of the claims in *Mayo* that they cover activities "wherein" the natural laws apply. 132 S. Ct. at 1297.

Similarly, making adjustments in chronological order adds nothing new; the running ledger is familiar to anyone with a checkbook or any other bookkeeping responsibilities. *See* Larry M. Walther & Christopher J. Skousen, *Basics of Accounting & Information Processing: The Accounting Cycle* 33 (2010) (a ledger is "a log book that contains a chronological listing of a company's transactions and events"). In banks, moreover, "transactions must be recorded as soon after their occurrence as possible." Munn, *supra*, at 81.

Likewise, use of a computer to automate the calculations involved in adjusting account balances does not save Alice's claim. Indeed, Alice's method involves the very type of computer participation rejected as insufficient in *Benson* and *Flook*. In *Benson*, the Court explained that a computer "solv[es] a problem by doing arithmetic as a person would do it by head and hand." 409 U.S. at 65. In *Flook*, the computer was used for "computerized calculations producing automatic adjustments." 437 U.S. at 586. Calculation is another of the most general, basic, and routine uses of a computer. The claims do not specify a particular type of software or improvement to computer technology for the calculations. There is nothing inventive in the "adjusting" step.

d. "[A]t the end-of-day," the fourth step involves "irrevocable" "instruct[ions]" from the intermediary to "exchange credits or debits" in the parties' real-world accounts to reflect the ending balances in the "shadow" accounts. J.A. 384. As the district court recognized, sending irrevocable instructions at the conclusion of the trading period "is subsumed within the abstract idea itself, if not insignificant postsolution activity." Pet. App. 222a.

Contrary to Alice's unsupported assertion (Pet. Br. 49–50), irrevocable, and near-simultaneous, exchange instructions are inherent in escrow. *See* Restatement (Second) of Contracts § 103 cmt. b (1979) ("Where the owner of property delivers in escrow the property or an instrument of transfer, the title to the property does not pass until the condition has occurred, but the delivery is irrevocable and creates immediate conditional rights in the transferee").

Alice also makes much of the fact that the shadow accounts in its claims are reconciled with the real-world accounts each *day* whereas others could choose to adjust shadow accounts differently—for example by creating new shadow accounts which are reconciled with real-world accounts for each *transaction*. Pet. Br. 49–50. To be sure, the Federal Reserve and a few other clearing houses use such an alternative (known as "real-time gross settlement"). *See* Alexandra Schaller, *Continuous Linked Settlement: History and Implications* 8, 17 (Dec. 5, 2007) (unpublished dissertation, University of Zurich), *available at* http://opac.nebis.ch/ediss/20080261.pdf. But this approach imposes transaction costs and other inefficiencies; for these reasons and others, including liquidity requirements, end-of-day adjustments are common across the financial services industry. *Id.* at 9, 11–12. Most banks take their "net balance[s] of purchases and sales in a foreign currency *at the end of a business day*." American Bankers Association, *supra*, at 189 (emphasis added). This is a fundamental way to perform financial intermediation. *See* Group of Experts on Payment Systems of G10 Central Banks, Report on Netting Schemes 14 (1989); Schaller, *supra*, at 9, 11.

The district court correctly recognized that the "instructing" step is mere communication, and therefore at most "conventional" "[p]ost-solution activity." *Mayo*, 132 S. Ct. at 1299. The middleman's directive after a day of trading is merely "routine, well-understood" activity, as should also be apparent to anyone who has wired money, traded stocks online, or transferred funds from one account to another using online or telephone banking. Using a computer to "instruct" is conventional for the same reasons that the use of a computer in communications in the "obtaining" step is routine. Thus, the Federal Circuit even before *Mayo* had rejected as ineligible a process involving the computerized communication of financial data. *See Dealertrack*, 674 F.3d at 1334–35.

2. The step-by-step analysis of the representative method claim in this case demonstrates that none of the elements adds anything inventive to the abstract idea of intermediated settlement or escrow. Considering the steps as an "ordered combination," as required by *Mayo*, shows that the claim as a whole "adds nothing ... that is not already present when the steps are considered separately." 132 S. Ct. at 1298; *see* Pet. App. 191a, 222a, 236a n.30 ("considered as a whole," Alice's claims are drawn to an abstract idea).

Taken together, the steps describe a process for (a) creating shadow accounts, (b) obtaining values for those accounts, (c) adjusting the accounts for transactions, and (d) sending instructions to exchange debits and credits in real-world accounts corresponding to the adjustments to the shadow accounts. J.A. 383–84. These "steps, when viewed as a whole, add nothing significant beyond the sum of their parts taken separately." *Mayo*, 132 S Ct. at 1298. Read as a whole, they simply say: "Perform an intermediated settlement arrangement."

Indeed, there is no mystery about what the ordered combination in the representative method claim means: According to the patent specification, the process entails "debiting/crediting, on a real-time basis, the relevant shadow records" and then "periodically effecting ... corresponding payment instructions." J.A. 293–94; *see* Pet. Br. 29 (explaining importance of the written description).

As the plurality below correctly recognized, this is nothing other than "an escrow arrangement." Pet. App. 29a–31a. To so hold was not an impermissible "deconstruction of the claim" to find its "heart," as Alice charges (Pet. Br. 32), but rather a straightforward reading of the '479 patent. *Cf. Markman* v.

Westview Instruments, Inc., 517 U.S. 370, 384 (1996) ("construing the letters-patent, and the description of the invention and specification of claim annexed to them" is "a question of law, to be determined by the court") (quoting *Winans* v. *Denmead*, 56 U.S. (15 How.) 330, 338 (1854)).

Method claim 33 simply recites, as the accompanying disclosure confirms, intermediated settlement with the aid of an unspecified computer. In the context of these patents, that is no different than stating the abstract idea and adding, "compute it."

3. Alice's other claims are ineligible for the same reasons as its representative method claim, even though some may be "narrow[er]." *See Mayo*, 132 S. Ct. at 1295, 1302; *Bilski*, 130 S. Ct. at 3231. That is because they too add nothing of substance to the abstract idea of financial intermediation. Indeed, Alice effectively conceded at the PTO that its later-issued system and media claims were no different in terms of patentability from the method claims in the first-issued '479 patent. *See* C.A. J.A. 184–232 (recounting this history).

Alice makes no argument that its media claims should be treated any differently than the representative method claim. Pet. Br. 48–53.

As to its system claims, Alice stresses the "tangibility" of the computer components. Pet. Br. 52–53. Those claims recite "[a] data processing system" with "a communications controller" and "a data storage unit" with information about the two parties' accounts and "a computer" that is "configured to" perform the steps described in the method claims. *See*, *e.g.*, J.A. 954–66, 65:42–70:53; J.A. 1255–62, 65:2–68:4 (claims 1–84 of the '720 patent and claims 1–38 of the '375 patent). As Judge Lourie explained, the claimed system "would encompass any device capable of performing the same ubiquitous calculation, storage, and connectivity functions required by the method claims." Pet. App. 37a; *accord Bancorp*, 687 F.3d at 1276–77.

The "configured to" language in the system claims simply describes the computer "in terms of what it will do." *Halliburton Oil Well Cementing Co.* v. *Walker*, 329 U.S. 1, 9 (1946), *superseded by statute*, 35 U.S.C. § 112. It "focuse[s] on the *result* of the invention," rather than the programming needed "to get there." Feldman Br. 9. The "flowcharts" included with Alice's patent drawings, insofar as they pertain to the asserted claims, merely illustrate how intermediation works. *E.g.* J.A. 168 ('479 patent, Fig. 25). The "algorithms" cited by some judges below (*see* Pet. App. 73a–76a (opinion of Rader, C.J.), 95a–97a (opinion of Moore, J.)) do not pertain to the asserted claims. BIO 5–6, 22; *cf.* Pet. Br. 7. Thus, the "configured to" language is not meaningful for Section 101 purposes. Feldman Br. 9–11; *see also* note 1, *supra*.

The much-vaunted computer implementation, according to the patent specification, "allow[s] the management of risk in an automated manner by means of programming of the computing devices." J.A. 300. Alice's own expert acknowledged that any standard desktop computer could serve as the recited "system." Pet. App. 225a.

What Alice characterizes as the "specific hardware" recitations in the system claims (Pet. Br. 53)—off-the-shelf processors, data storage units, and the like—are "generic, functional terms" (Pet. App. 37a (opinion of Lourie, J.)), drafted to "effectively cover *any device* that performs that function in any way," that describe "standard elements." Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905, 919–23 (2013).

Patent applicants often describe their inventions using language designed to invoke different statutory classes. *See* Robert C. Faber, *Faber On Mechanics of Patent Claim Drafting* 10-6 (6th ed. 2012) (instructing patent prosecutors to "[u]se [d]ifferent [statutory] [c]lasses of [c]laims" in a section titled "How to Write the Broad Claim"). As Judge Prost explained in her panel dissent, "[a]ny method claim that uses a general purpose computer may also be drafted as a system (containing computers) that carries out the method." Pet. App. 168–69a; *see also Quanta*, 553 U.S. at 629 ("Patentees seeking to avoid patent exhaustion could simply draft their patent claims to describe a method rather than an apparatus"); *In re Maucorps*, 609 F.2d 481, 485 (C.C.P.A. 1979) ("Labels are not determinative in § 101 inquiries ... because the form of the claim[s] is often an exercise in drafting") (internal quotation marks omitted).

Thus, this Court has long warned that a "competent draftsman" should not be able to circumvent the rigors of Section 101 through non-substantive changes to the claim language. *See Flook*, 437 U.S. at 590 ("The concept of patentable subject matter under § 101 is not 'like a nose of wax which may be turned and twisted in any direction'") (quoting *White* v. *Dunbar*, 119 U.S. 47, 51 (1886)). Changing the first noun in the claim preamble from a "method" (*see*, *e.g.*, '510 patent, claim 1, J.A. 669–70, 64:2–64:21) to a "data processing system" (*see*, *e.g.*, '720 patent, claim 1, J.A. 954–55, 65:41–61) or a "computer program product" (*see*, *e.g.*, '375 patent, claim 39, J.A. 1262–63, 68:5–35) cannot be the sole determinant of eligibility.

An applicant that submits both method claims and system claims covering the same basic elements, using the same specification, has contributed no more to progress with his system claims than with his method claims. A system (or "machine") claim that forecloses as much innovation as a method (or "process") claim is for the same reason ineligible. *Diehr*, 450 U.S. at 188 n.11 ("the same principle" excluding abstract ideas "applies to" both "a process claim" and "a 'product' claim"). As explained above, that is true here. Alice's media and system claims fall with its method claims.

4. Alice's bid for eligibility ultimately rests on the contention that "[t]he invention *as claimed* will not function without a computer." Pet. Br. 49 (emphasis added). It is tautological that a computer-implemented claim requires a computer. But that alone will rarely if ever be sufficient for eligibility; otherwise any abstract idea (or law of nature or natural phenomenon) could be patented merely by including an off-the-shelf computer in the claims. That approach would resurrect the "machine" part of the eligibility test that this Court *rejected* in *Bilski*. 130 S. Ct. at 3226–27. It is certainly not sufficient here.

As the Court has explained, "[a] digital computer ... operates on data expressed in digits, solving a problem by doing arithmetic as a person would do it by head and hand," albeit using different physical processes than those employed by the human brain. *Benson*, 409 U.S. at 65; *see also* Pet. App. 30a (opinion of Lourie, J.) ("At its most basic, a computer is just a calculator capable of performing mental steps faster than a human could"). To execute this task, computers store data, manipulate those data, and communicate. *Benson*, 409 U.S. at 65. Today, computers and other devices capable of performing these basic functions are ubiquitous.

Although some uses of computers might be routine only in particular fields, using a computer to record, calculate, and communicate is commonplace across all fields. Just as the use of widely available tools to "measure[] metabolites" was "routine" in *Mayo* (132 S. Ct. at 1298), so too the use of computers to make financial calculations is "routine" (and was "as of the patents' priority dates") (Pet. App. 40a (opinion of Lourie, J.)). *See*, *e.g.*, *Bilski*, 130 S. Ct. at 3231 (concluding that the "random analysis techniques" present in some claims were "well-known"); *Flook*, 437 U.S. at 586, 594 (holding that "changing alarm limits" is "conventional").

As the district court found, because financial transactions "are increasingly likely to be monopolized by electronic and computer implementation and storage, the fact these claims are implemented electronically fails to limit the methods." Pet. App. 221a. This conclusion, unchallenged by Alice, shows that Alice's computer implementation does not narrow the scope of its claims in practice.

Alice's own expert acknowledged that "the claimed methods" require only "*some type* of computing processor and memory." J.A. 128 (emphasis added). This includes *any* computer available now or in the future. Pet. App. 225a. Thus, just like the ineligible claims in *Benson*, Alice's sweeping escrow method can be "performed through any existing machinery or future-devised machinery or without any apparatus." 409 U.S. at 68.

Alice's expert further admitted that "it is possible to perform the business methods of maintaining accounts, adjusting accounts, and providing an instruction without a computer or other hardware." J.A. 128. He also conceded that the claimed "invention" could be "implemented ... in a non-electronic manner using various pre-computing tools such as an abacus or handwritten ledgers." *Ibid.* These admissions—which Alice fails to mention in its merits brief—are fatal.

A method that "can be done mentally ... without a computer" (*Benson*, 409 U.S. at 67), or with "pencil and paper" (*Flook*, 437 U.S. at 586), is not patent-eligible. *CyberSource*, 654 F.3d at 1372 (computer-implemented "method steps [that] can be performed in the human mind, or by a human using a pen and paper" are unpatentable); *SmartGene, Inc.* v. *Advanced Biological Labs., SA*, No. 2013-1186, 2014 WL 259824, at *5 (Fed. Cir. Jan. 24, 2014) ("familiar mental steps performed by or with a computer" are ineligible); *see* MPEP § 2106.II.B.1(d)(f).

Thus, Alice's assertion that its "claims require a substantial and meaningful role for the computer—beyond merely performing computations more quickly or accurately than a person could do with pencil and paper" (Pet. Br. 48) is as irrelevant as it is inaccurate. Because Alice's computer implementation merely instructs practitioners "do as you normally would," it "fails to limit" the claims in any meaningful way, as the district court explained. Pet. App. 221a. In the context of these patents, computer implementation adds nothing to the abstract idea of intermediated settlement. Thus, the claims at issue are not patent-eligible.

III. ALICE'S EFFORT TO UNDERMINE *BILSKI* AND *MAYO* WOULD IMPEDE INNOVATION IN VAST SECTORS OF THE ECONOMY

To hold that the claims asserted by Alice are patent-eligible, the Court would have to disavow if not overrule both *Bilski* and *Mayo*. Yet Alice has not even tried to make the significant showing that would be necessary to justify an about-face from such recent and unanimous precedents, which the Court unanimously confirmed just last Term. *Myriad*, 133 S. Ct. at 2116.

A departure from *Mayo* and *Bilski* would "disrupt the settled expectations of the inventing community." *Festo Corp.* v. *Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 739 (2002). Those cases "str[uck] a delicate balance" of incentives for research and competition by applying a "well-established standard" (*Myriad*, 133 S. Ct. at 2116) that can and should be applied here.

Patents like Alice's contribute only the "easy" task of "think[ing] of abstract ideas about what a computer or website should do," but "leave to others the truly innovative work of developing applications of the idea." Google C.A. Br. 23–24. It is one thing to conceptualize, say, a self-driving car; it is quite another to actually build and operate one. Alice's behavior is akin to that of an explorer who places his toe on the coast of Florida and then grandiosely claims, "North America for Spain!" Even if the explorer has described step-by-step, in generic terms, how to navigate rivers, forage for vegetables, set up towns, and the like, he has never actually done those things; thus, his claim—and the innovation and development he has foreclosed—is vastly disproportionate to the discovery he has contributed. *Life*

After Bilski, *supra*, at 1338 (patents like these "claim everything and contribute nothing"). The inventive community understands and expects that exclusive rights under the patent laws will be afforded to those who actually expend the necessary resources and innovate.

Alice, which has provided no service or product to the marketplace, wants to use its patents to hold hostage a systemically important financial institution that developed, at great effort and expense, a global network that makes possible the safe and efficient settlement of the vast majority of transactions in the world's major currencies. For the price of a patent application, Alice is putting at risk CLS's billion-dollar investment—and with it the largest financial market in the world. *See* FSOC, 2012 Annual Report, Appendix A at 157 (summarizing "negative effects" of disruption to CLS Bank's operations on "U.S. and global financial markets").

The potentially adverse ramifications go far beyond the foreign currency market. As the district court found, the asserted claims implicate every "credit card company," "bank," "guarantor" or other entity that supervises "any transaction linked to a 'share price,' a 'weather event,' a 'market event,' or a 'currency exchange transaction.'" Pet. App. 219a–20a (quoting dependent claims). Alice does not dispute that finding.

Thus, if these patents were to be resurrected, Alice could assert them against virtually every financial institution—commercial banks, investment banks, clearing houses, insurance companies, mutual fund complexes, broker-dealers, title insurers, etc.—that performs intermediation using a computer. The only reason it has not done so already is, presumably, the judgment of ineligibility properly entered in this litigation.

"[A] patent is not a hunting license." *Brenner* v. *Manson*, 383 U.S. 519, 536 (1966). The public "has a paramount interest in seeing that patent monopolies are kept within their legitimate scope." *Medtronic, Inc.* v. *Mirowski Family Ventures, LLC*, 134 S. Ct. 843, 851 (2014) (punctuation omitted). No person should "be allowed to exact royalties for the use of" a basic "idea." *Id.* at 852 (punctuation omitted). That is all the more true where, as here, a non-practicing entity threatens an innovative company's productive operations. *See eBay Inc.* v. *MercExchange, L.L.C.*, 547 U.S. 388, 396 (2006) (Kennedy, J., concurring); *see also, e.g.*, Kris Frieswick, *The Real Toll of Patent Trolls*, Inc. (Feb. 14, 2013), www.inc.com/magazine/201202/kris-frieswick/patent-troll-toll-on-businesses.html.

A straightforward application of *Bilski* and *Mayo*, as well as this Court's other eligibility precedents, establishes that all of the claims asserted in this case fall within the longstanding exception to patentability for fundamental principles. They recite an abstract idea under *Bilski*, and their limitations, including computer implementation, add nothing more under *Mayo*. The Court should reject Alice's implicit—and some of its *amici*'s explicit—request to drive a stake through the heart of *Bilski* and *Mayo*. Under those decisions, the judgments of both courts below, concluding that the asserted claims are not patent-eligible under 35 U.S.C. § 101, can only be affirmed.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

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APPENDIX

U.S. Patent No. 5,970,479 (excerpts)

US005970479A

United States Patent [19]

Shepherd

[11] **Patent Number:** **5,970,479**

[45] **Date of Patent:** **Oct. 19, 1999**

[54] **METHODS AND APPARATUS RELATING TO THE FORMULATION AND TRADING OF RISK MANAGEMENT CONTRACTS**

[75] Inventor: **Ian K. Shepherd**, Toorak, Australia

[73] Assignees: **Swychco Infrastructure Services Pty. Ltd.**, Melbourne, Australia; **Swychco Support Services Pty. Ltd.**, Sydney, Australia

[21] Appl. No.: **08/078,136**

[22] Filed: **May 28, 1993**

[30] **Foreign Application Priority Data**

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Jan. 30, 1992	[AU]	Australia	PL 3216

[51] **Int. Cl.**^{6} **G06F 17/60**

[52] **U.S. Cl.** **705/37; 705/4**

[58] **Field of Search** 364/408; 705/4, 705/37

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[57] **ABSTRACT**

Methods and apparatus which deal with the management of risk relating to specified, yet unknown, future events are disclosed.

'Sponsor' stakeholders specify a particular product relating to an event or phenomenon for which there is a range of possible future outcomes.

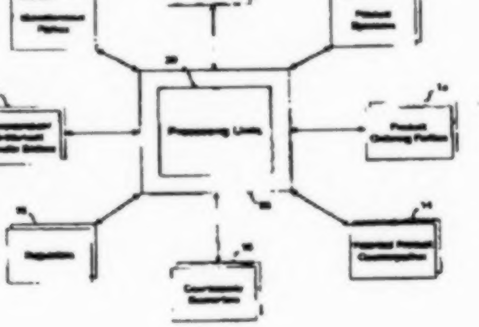
'Ordering' stakeholders then offer contracts relating to the predetermined phenomenon and corresponding range of outcomes. The offered contracts specify an entitlement or (pay-off) at the future time of maturity for each outcome, and a consideration (or premium) payable, in exchange, to a 'counter-party' stakeholder.

Independently of the offered contracts, the 'counter-party' stakeholders input data as to their view of the likelihood of occurrence of each outcome in the predetermined range into the future, or specifically at the predetermined date of maturity.

Each offered contract is priced by calculating counter-party premiums from the registered data, and a match attempted by a comparison of the offered premium with the calculated premiums.

Matched contracts can be further traded until maturity, and at-maturity processing handles the exchange of entitlement as between the matched parties to the contract.

39 Claims, 101 Drawing Sheets



The invention also encompasses apparatus and method ling with the handling of contracts at maturity, and cifically the transfer of entitlements.

Therefore, in accordance with a further aspect of the ention, there is disclosed a method of exchanging obli- ions as between parties, each party holding a credit record l a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

(a) creating a shadow credit record and debit record for each party to be held independently from the exchange institutions by a supervisory institution;

(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and debit record;

(c) for every transaction resulting in an exchange obligation, the supervisory institution adjusts each respective party's shadow credit record or debit record, allowing only those transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and

(d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

7. Description of Consideration/Entitlement Payment Process

The purpose of the CONTRACT APP consideration/entitlement (and related transactions) payment/receipt process is to effect debits and credits to INVENTCO stakeholder accounts, typically at maturity of a contract, with participating consideration/entitlement transfer (or exchange) entities, reflecting payment/receipt entitlements and obligations originated within INVENTCO. The process effects these payments/receipts in a two-stage process. First, by debiting/crediting, on a real-time basis, the relevant shadow records (in the data file PAYACC SHADOW) of the applicable stakeholder accounts-with a participating consideration/entitlement transfer entity (C/E entity), external to INVENTCO, with which they maintain an account. And second, by periodically effecting, via existing and potential payment mechanisms, corresponding payment instructions to the payment entities concerned. Details of the above-described mechanisms are as follows.

All INVENTCO stakeholders maintain (a minimum of) two special-purpose (net-credit balance only) accounts with (at least) one selected, VIRPRO authorised, C/E transfer entity. The purpose of special-purpose accounts is to ensure that only INVENTCO-initiated debits and credits are capable of being effected to the accounts. Thus, at any time the balance of each PAYACC SHADOW file account record should, be equivalent to the true, but usually unknown, time-of-day balance of the actual account maintained by the C/E transfer entity.

The purpose of two accounts is to enable only credits to be effected through one account and only debits through another account. And the purpose of "net-credit balance only" accounts is to ensure that accumulated debits to the debits-only account never exceed the account opening balance plus accumulated credits to the credits-only account. C/E transfer entities will typically be (but do not need to be) institutions of any/all of six types: public/private record-registries of various types; credit card companies (typically for retail transactions only); commercial banks; central banks; taxation authorities; and non-bank clearing houses and depositories.

The resources transferred by these entities may be of any type. However, most typically, they will be deposits appropriate for the entity concerned: With respect to public/private record-registries—entitlement deposits (including shares in financial or physical assets, participation rights in wagers, and so on). With respect to credit/debit card companies—normal card company deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to commercial banks—normal bank deposits (denominated in national currencies or synthetic currencies (for example, SDRs)). With respect to central banks—exchange settlement account (or equivalent) deposits. With respect to taxation authorities—taxation account deposits. And with respect to non-bank clearing houses and depositories—deposits of financial instruments, precious metals and the like. CONTRACT APP potential counterparties will also effectively be C/E transfer entities, as will ordering party guarantors (external to INVENTCO) where they offer credit to product ordering parties. Also, some accounts will be trust accounts maintained on behalf of potential counterparties (and some product ordering parties) involved in applications requiring the periodic payment of collateral to independent third parties to serve as an additional security device.

Immediately after the completion of its daily—or more frequent—transaction processing, and their associated settlement functions, each C/E transfer entity electronically notifies the applicable CONTRACT APP of the "opening balances" of all the debit and credit INVENTCO accounts it maintains (At this stage, the debit account balance should be zero and the credit account balance should be greater than or equal to zero). Where an INVENTCO stakeholder has an overdraft or line-of-credit with its C/E transfer entity, the credit value of this will be reflected in the non-zero balance of its credit account at this time.

Upon receipt of the above-described notifications, the applicable CONTRACT APP updates/confirms its stakeholder shadow balances. Thus, at this point-in-time, all credit and debit shadow account balances should be equivalent to their actual debit and credit account balances.

Progressively throughout the day (where "day" here is likely to be different for each C/E transfer entity due to a combination of differences in the time-zone locations of payment entities in relation to the applicable CONTRACT APP, and the likely different account processing cycles of these entities), INVENTCO-stakeholder—authorised debits and credits to INVENTCO stakeholder shadow accounts are effected on a real-time basis—debits to debit accounts and credits to credit accounts. At all times, the CONTRACT APP ensures that the cumulative debit balance of each stakeholder's debits account does not exceed the "opening balance" plus the cumulative credit balance of the stakeholder's credit account. Thus, at any time, for every INVENTCO stakeholder, the combination of each stakeholder's debit account and credit account will represent the "true", net, time-of-day value of the stakeholder's two actual special-purpose accounts maintained external to INVENTCO.

Debits and credits to INVENTCO stakeholder accounts are effected according to strict rules and conditions, being different for credits and debits. Credits can be made to any INVENTCO stakeholder's credit account with its nominated C/E transfer entity by any other INVENTCO stakeholder for any reason. Naturally, as INVENTCO stakeholders will not know the account details of other stakeholders, such credits will be effected either automatically, according to information and rules known by the applicable CONTRACT APP, or semi-automatically by way of an INVENTCO stakeholder requesting from VIRPRO, as they need to do so, a credit-account number of the stakeholder to which they wish to transfer assets. This account number may only be valid for a nominated period and would not typically be the specified stakeholder's actual account number with its nominated consideration/entitlement transfer entity—it would only be a reference to an INVENTCO file containing this number.

On the other hand, debits can only be made to an INVENTCO stakeholder's debit account with its nominated C/E transfer entity by the stakeholder itself, and by other stakeholders explicitly granted this right by each stakeholder, subject to these other stakeholders exercising this right according to the rules and conditions specified for them.

Where an INVENTCO stakeholder seeks to initiate/authorise debits to its nominated account(s) on its own, this can only be done through the stakeholder satisfactorily completing the identification and security procedures set down by their C/E consideration/entitlement transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). The type of procedure set down by all participating C/E transfer entities involves (at least) the following: First, the consideration/entitlement transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts, and a similarly confidential "black box" which, by initiating any of a number of possible proprietary password request-response processes involving any one of its customers possessing the appropriate device (s), confirms that remote messages received from that customer, and processed by the "black box", are authentic. Second, the consideration/entitlement transfer entity supplying their INVENTCO customers with a programmable smart card (or equivalent device) enabling each customer, remotely—via telephone or direct computer line, to unambiguously confirm their identity with their INVENTCO-maintained account, thereby having the capability to authorise debits to their account within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on. Third, INVENTCO providing the mechanisms for direct, confidential, stakeholder communications with their C/E transfer entity shadow debit accounts, and the formal updating of these accounts, through non real-time processes, utilizing the unique time-stamped reference numbers created as/when stakeholders authorise access to their account records.

Where an INVENTCO stakeholder has authorised other INVENTCO stakeholders to initiate debits to (any of) its nominated account(s) according to a standing authority of some type, this can only be done through the authorised stakeholder itself satisfactorily completing the identification and security procedures set down by the authorisation-granting stakeholder's nominated C/E transfer entity (and reflected in VIRPRO-specified INVENTCO communication procedures). Once again, the type of procedure, set down by all participating C/E transfer entities in this respect, involves (at least) the following: First, the C/E transfer entity supplying VIRPRO with a confidential file of account Pin numbers corresponding to each of its INVENTCO stakeholder debit accounts and each other INVENTCO stakeholder which has been authorised to effect debits (within defined parameters) to these accounts. Second, the C/E transfer entity supplying VIRPRO with a similarly confidential black box which, by initiating any of a number of possible proprietary password request-response processes involving an entity nominated by any of its customers possessing the appropriate device(s), confirms that remote messages received from that authorised entity, and processed by the black box, are authentic. Third, the C/E transfer entity supplying their INVENTCO customers with a collection of programmable smart cards (or equivalent devices), for distribution to these authorised entities, enabling each authorised entity, remotely—via telephone or direct computer line—to unambiguously confirm their identity with the customer's PAYACC SHADOW account, thereby having the capability to authorise debits to this account (again, within predefined parameters concerning factors such as maximum transaction amounts, possible transaction types, account usage patterns and so on). And four, INVENTCO providing the mechanisms for direct, confidential, authorised stakeholder communications with a stakeholder's C/E transfer entity shadow debit account(s).

At the end of each C/E transfer entity's specified day (or part of a day), the applicable CONTRACT APP transfers (at least) two things to the entity: First, if required, a series of figures representing the exchange settlement (or equivalent) accounting entries it has or will communicate to the C/E transfer entity's appropriate clearing authority (for each of the applicable consideration/entitlement denomination, currency and national currency types of the payments/receipts involved) where these figures represent the balancing net debit or credit figure corresponding to the aggregation of all of the entity's INVENTCO customer transactions in the prior day. And second, a detailed file of all customer transactions effected during the day (corresponding, if required, to the above-described net figures). Upon their receipt of these transactions and summary figures, the C/E transfer entity then debits/credits each transaction to the appropriate actual customer accounts, enabling new "closing" account balances to be calculated (these "closing" balances should be exactly the same as the end-of-day balances communicated by the applicable CONTRACT APPS with it's file of customer transactions). In turn, these

"closing balances" become the C/E transfer entity's account "opening balances" for the next day. The CONTRACT APPS notification process then repeats itself.

Where applicable, at days-end for the "clearing house" of clusters of like C/E transfer entities (for example, a national central bank), CONTRACT APP transfers netted exchange settlement accounting entries to the clearing houses concerned. These entries serve to "balance the individual customer account entries transferred to each associated C/E transfer entity individually.

8. Industrial Applicability

The invention has industrial application in the use of electrical computing devices and data communications. The apparatus and methods described allow the management of risk in an automated manner by means of programming of the computing devices. The types of events associated with the risk management apparatus and methodologies includes physical and technical phenomena, and therefore have value in the field of economic endeavour.

33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

(a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;

(b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;

(c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and

(d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

34. The method as in claim 33, wherein the end-of-day instructions represent credits and debits netted throughout the day for each party in respect of all the transactions of that day.

REPLY
BRIEF

RECORD
AND
BRIEFS

Supreme Court, U.S.
FILED
MAR 19 2014
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No. 13-298

IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

REPLY BRIEF

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REPLY BRIEF

While both CLS and the Government ask the Court to affirm, their briefs are otherwise polar opposites.

CLS agrees with Alice that the abstract ideas exception is narrow, and that "just like laws of nature and natural phenomena," abstract ideas are not patent-eligible because "'they are the basic tools of scientific and technological work.'" Resp. Br. 15 (quoting *Gottschalk* v. *Benson*, 409 U.S. 63, 67-68 (1972)). While it quibbles with Alice's reading of the exception, CLS's principal argument turns on the facts—namely, the scope of the asserted claims. On CLS's telling—which fails to address the actual claim language—Alice's claims "recite the fundamental economic practice of intermediated settlement or escrow," and therefore "purport to monopolize 'a fundamental economic practice' of 'protecting against risk.'" *Id.* at 1, 11 (quoting *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3231 (2010)). None of the limitations actually recited in the claims—which CLS dismisses as "details"—makes any difference, CLS contends, because each has been previously "used in financial intermediation." *Id.* at 30, 41. CLS further urges the Court to ignore the claims' computer-implementation requirements because a computer supposedly is not necessary to the invention, and argues that the case does not even implicate the "patentability of 'software.'" *Id.* at 11 n.1, 35-40.

Directly contradicting CLS, the Government acknowledges that the claims "include a relatively detailed set of steps, and therefore do not preempt all uses of third-party intermediaries to mitigate settlement risks." U.S. Br. 7. It also agrees with Alice, unlike CLS, that the claimed invention "relies for its efficacy" on a computer. *Id.* at 8. Nonetheless, the

Government asks the Court to declare the claims ineligible using a new and expansive—and unprecedented—version of the abstract ideas exception. Its version would extinguish all business method patents (contrary to the Court's holding in *Bilski*), and would adopt a special rule for computer-implemented inventions, requiring that computer-focused limitations (and only computer-focused limitations) be ignored unless they represent an undefined "advancement in computing technology." *Id.* at 16. Thus, while CLS contends that this case does not concern software patents, the Government asks the Court to announce sweeping new policy that would render virtually all software ineligible for a patent. *Id.* at 6-7, 16-17, 25-26, 28-32.

Although CLS's and the Government's arguments are irreconcilable, they share a common flaw: both ignore the controlling text. CLS disregards the text of the patent claims, relying instead on a caricature of the claims in an attempt to shoehorn them into the abstract ideas exception. That effort is inconsistent with a host of precedents establishing that claims must be read as a whole and according to their express terms. The Government, meanwhile, disregards the text of § 101, proposing a dramatic expansion of a judicial *exception* to that text that would render the exception inconsistent with the statute. That effort, too, conflicts with a host of precedents. Because both CLS and the Government advance arguments that have no textual anchor, it is unsurprising that both are blown wildly off course. Similarly unsurprising, neither can reconcile its position with *Diamond* v. *Diehr*, 450 U.S. 175 (1981), this Court's most recent statement on the patent-eligibility analysis for computer-implemented inventions.

The proper approach, as Alice explained, is spelled out in this Court's § 101 precedent, including *Diehr*, *Bilski*, and *Mayo Collaborative Services* v. *Prometheus Labs.*, 132 S. Ct. 1289 (2012): The abstract ideas exception is limited to fundamental truths, which exist apart from any human action, and which are therefore properly excluded from § 101 because they are not "new." Pet. Br. 21-29. This Court's precedents further establish that only claims that expressly recite a fundamental truth on their face may be deemed ineligible as abstract ideas, and the novelty of the claimed invention (or any individual limitation) is irrelevant. *Id.* at 29-35. Applying these principles to Alice's actual claims demonstrates that those claims define eligible subject matter under § 101.

I. CLS'S POSITION RESTS ON MULTIPLE DISTORTIONS OF THE FACTS, THE LAW, AND ALICE'S ARGUMENTS.

A. This Court's Cases Provide For A Limited Abstract Ideas Exception Consistent With Section 101.

CLS agrees with Alice's explanation (Pet. Br. 20-23) of the purpose and statutory role of the abstract ideas exception. Indeed, CLS asserts that "abstract ideas are not patentable because—just like laws of nature and natural phenomena—'they are the basic tools of scientific and technological work.'" Resp. Br. 15 (quoting *Benson*, 409 U.S. at 67-68); see also *id.* at 16 (acknowledging that the exception is "'consistent with the statutory text'") (quoting *Bilski*, 130 S. Ct. at 3229 (plurality opinion)). CLS also does not dispute Alice's showing (Pet. Br. 27-29) that disembodied concepts (unlike fundamental truths) do not give rise to this same concern and therefore do not implicate the abstract ideas *exception*, but are ineligible because they do not fit within the four categories of § 101.[1] See Resp. Br. 18 n.4.

Nonetheless, CLS disputes the conclusion that the abstract ideas exception is limited to fundamental truths. See Resp. Br. 19. CLS does this by constructing a straw man, mischaracterizing Alice's argument to be that "ineligible abstract ideas are *limited* to mathematical formulas." *Id.* at 21. Alice *actually* argued—quoting this Court—that the abstract ideas exception extends to "'mathematical formulas *and the like*.'" Pet. Br. 16 (quoting *Mayo*, 132 S. Ct. at 1303) (emphasis added). And that is exactly what this Court's cases establish: the abstract ideas exception extends only to concepts akin to a law of nature or mathematical formula, in the sense that they describe a preexisting principle or relationship that holds true apart from any human action. *Id.* at 21-27 (citing cases).

CLS attacks another straw man when it contends that under Alice's view of "abstract ideas," claim 1 in *Bilski* would have been eligible, because hedging did not "'preexist[]' humankind." Resp. Br. 20 (alteration in original); see also U.S. Br. 22 (making a similar point concerning baseball statistics and sabermetric analysis). CLS misunderstands both Alice's argument and this Court's cases. It is true that hedging (and baseball statistics) did not "preexist humankind," but that is not the relevant question, and that is not Alice's argument. See Pet. Br. 22. Indeed, the law of nature at issue in *Mayo*—the correlation between metabolite levels in human blood and drug efficacy in treatment of humans—did not "preexist humankind." The relevant question in identifying an abstract idea under this Court's cases is whether the principle in question holds true "apart from any human action." *Mayo*, 132 S. Ct. at 1297.

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[1] Certain *amici* assert that Alice argues that disembodied concepts are patent-eligible. ACLU Br. 21; Google Br. 15-16. To the contrary, disembodied concepts are *in*eligible because they "do not fit within the four categories of § 101." Pet. Br. 28, 46.

And that is plainly true of the abstract idea in Bilski's claims. As the Court explained, Bilski's claim 1 recited a logical truism—*i.e.*, risk from one fixed price transaction can be avoided by engaging in an offsetting transaction at another fixed price. See *Bilski*, 130 S. Ct. at 3223, 3231; Pet. Br. 26. The *Bilski* claim therefore merely "explain[ed]" a relationship between two numbers (the fixed price in one set of transactions and the fixed price in a second set)—a relationship that preexisted Bilski's attempt to patent the idea and that exists independent of human action. 130 S. Ct. at 3223, 3231. Indeed, the Court took pains to make clear that the method of claim 1 recited this relationship between numbers, because the Court reiterated that claim 1 was "reduced to a mathematical formula in claim 4," *id.*, and as CLS rightly observes, "[m]athematical formulas express or explain *relationships*," Resp. Br. 22.[2]

Just like the relationship between blood metabolite levels and drug efficacy in *Mayo*, the numerical relationship between two fixed prices in Bilski's claims holds true regardless of any human action.[3]

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[2] CLS contends that Bilski's claim 4 "did not reduce the entire method [of claim 1] to a mathematical formula." Resp. Br. 19-20. The Court disagreed. 130 S. Ct. at 3223, 3231.

[3] The same is true of OPS (on-base percentage plus slugging percentage). *See* U.S. Br. 22. A process reciting the steps of adding one number (on-base percentage) to another (slugging percentage) to equal a third (OPS) recites a mathematical formula—*i.e.*, a relationship between numbers—that exists

The Court thus declared "the concept of hedging, described in claim 1 and reduced to a mathematical formula in claim 4" to be "an unpatentable abstract idea just like the algorithms at issue in *Benson* and *Flook*." *Bilski*, 130 S. Ct. at 3231.

CLS makes no effort to explain what its apparently broader definition of "abstract ideas" would comprise. Nor does it explain how any broader definition could be reconciled with § 101. CLS instead asks this Court to offer no further guidance concerning the meaning of "abstract ideas,"[4] and to perpetuate the confusion that produced the fractured non-decision below. Resp. Br. *i*, 14.

Instead of proposing a solution, CLS contends, without further explanation, that if Bilski's "method of mitigating risk is a 'fundamental truth,' then so too is the principle that the risk of one party's non-payment at settlement can be mitigated by designating an intermediary to ensure mutual compliance before directing the transfer of entitlement," which CLS claims is "the basic concept that Alice's claims address." *Id.* at 23. First, CLS's *ipse dixit* makes no sense: How can the principle CLS articulates hold true "apart from human action," as *Mayo* requires, if it requires human action (*i.e.*, designating an intermediary, ensuring mutual compliance, and directing a transfer)? But, ultimately, the Court need not reach any conclusion on that score, because this "basic concept" that Alice's claims supposedly

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apart from any human action, even though human action generates the particular values plugged into the formula.

[4] CLS suggests that this Court has deemed it inappropriate to "'define further' the scope of [the abstract ideas] exception." Resp. Br. 14 (quoting *Bilski*, 130 S. Ct. at 3231). This is a misquotation. The Court actually declined to "define further" the statutory term "'process.'" 130 S. Ct. at 3231 (quoting § 101).

"address" is nowhere recited in Alice's claims. And it is the actual claim language—not a litigant's self-serving caricature—that controls the § 101 analysis.

B. The § 101 Analysis Must Focus On The Claims As Written And As A Whole.

It is beyond dispute that claim language must be read as written and as a whole. Indeed, the point is firmly established in this Court's cases and is reiterated by numerous *amici*.[5] Nonetheless, CLS ignores this fundamental principle.

1. The Claims Do Not Recite "The Concept Of Intermediated Settlement Or Escrow."

CLS's driving premise is that the asserted claims "recite" what CLS describes as "the basic economic concept of intermediated settlement or escrow," a supposed abstract idea. *E.g.*, Resp. Br. 1, 9. Indeed, so crucial is this point to CLS that it repeats the assertion no fewer than 10 times, *id.* at *i*, 1, 2, 9, 11, 24, 25, 48, 56—and even claims, falsely, that "Alice does not deny that the asserted claims recite the concept of an intermediated settlement arrangement," *id.* at 25.[6] Not once, however, does CLS cite any claim language that actually "recites" the "concept" of "intermediated settlement or escrow." And there is none.

When this Court has identified an abstract idea or natural law in a patent claim, the abstract idea or natural law was *actually recited on the face of the*

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[5] *E.g.*, Advanced Biological Labs. Br. 29-30; AIPLA Br. 19; Michel Br. 6; Microsoft Br. 30.

[6] *But see* Pet. Br. 47 ("Alice did not purport to claim 'the concept of reducing settlement risk by facilitating a trade through third-party intermediation ....'").

claim. In *Mayo*, the claims expressly recited laws of nature—"namely, relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm." 132 S. Ct. at 1296. In *Bilski*, the claims expressly recited the relationship between two fixed prices that was "reduced to a mathematical formula" in claim 4. 130 S. Ct. at 3223, 3231. And in *Diehr*, the claims expressly recited the Arrhenius equation, an abstract idea expressed in the claims as "v=CZ+x." 450 U.S. at 179 n.5. In none of these cases—nor in any other case—has this Court countenanced CLS's approach of ignoring the actual claim language and constructing a caricature of the claims using general terms found nowhere in them. To the contrary, in *Diehr*, the Court expressly disapproved any analysis that does not focus upon the claim as written and "as a whole." *Id.* at 188.

There is no recitation of any "basic concept of financial intermediation or escrow" in Alice's claims. What Alice's claims actually recite is systems, methods, and media specifically configured to solve, in a particular way, the complex problem of settlement risk. See Pet. Br. 6-10. None of the claims purports to cover the "concept" of either intermediated settlement or escrow.

The Government's brief makes this clear. While CLS mischaracterizes the claims as having "breathtaking sweep," Resp. Br. 31, the Government recognizes that the claims "include a relatively detailed set of steps and therefore *do not preempt all uses of third-party intermediaries to mitigate settlement risks*." U.S. Br. 7 (emphasis added). The claims are, according to the Government, "relatively detailed, and therefore *narrow in their preemptive* *scope.*" *Id.* at 28 (emphasis added); see also *id.* at 27-28 & n.6.

CLS's mischaracterization is further demonstrated by its own inconsistencies concerning what the claims "recite," swerving between the concepts of "intermediated settlement," "escrow," or both—even though the two are not interchangeable (and even though neither appears on the face of the claims). See Pet. Br. 47-48. CLS acknowledges that Alice's claims "'do not *prescribe* that the electronic intermediary (or any other third party) receives any money or property,'" as required in actual escrow. Resp. Br. 29 (quoting Pet. Br. 47). This does not undermine its analysis, CLS argues, because "Alice's claims do not *preclude* the receipt of money or property and thus would cover such activity." *Id.* That is no way to read patent claims. The claims also do not "preclude" putting money on an airplane and transferring it that way—but that does not mean that they "cover" that activity. A settlement system must use *all* the elements of Alice's claims to be covered by those claims, and if some other system involves transfers of collateral (as in actual escrow) or air shipment of cash without the limitations of Alice's claims, it is not covered. If the claims actually "recited" any of the concepts CLS alleges, the way to demonstrate that would be by *quoting the claim language*.

Claim language must be taken seriously, for it plays the critical role of defining the "limits of the monopoly asserted" and informing the public "which features may be safely used or manufactured without a license and which may not." *Permutit Co.* v. *Graver Corp.*, 284 U.S. 52, 60 (1931); Pet. Br. 29-31. The § 101 analysis that CLS advocates—based not on the claims *as written*, but on a litigant's self-interested characterization of the "heart" or "gist" of a claim—

would flout this fundamental principle. Moreover, it would ensure that § 101 analyses will turn not on the claims, but on the gut feeling of individual judges based on made-for-litigation caricatures. See IBM Br. 19-20 ("anytime a court begins its analysis by looking for an abstract idea, it is surely going to find one").

2. Even If The Asserted Claims Could Be Read To Recite An Abstract Idea, They Claim At Most A Specific Application.

Ultimately, CLS must acknowledge that its caricatures of the claims ignore their actual limitations. CLS concedes that "a 'differently designed system'" to avoid settlement risk "could avoid direct infringement." Resp. Br. 30 (quoting Pet. Br. 49). This concession is determinative, for it makes clear that, even if the claims could be read to contain the supposed abstract idea of intermediated settlement, they do not preempt all practical uses of that idea. See *Diehr*, 450 U.S. at 187 (process claim that recites an abstract idea is eligible if it seeks "only to foreclose from others the use of [the abstract idea] in conjunction with all of the other steps in their claimed process").

CLS argues that "a patent need not foreclose every conceivable application of an abstract idea to be ineligible." Resp. Br. 30. "After all," it contends, "there were many ways of hedging risk not claimed by Bilski[, b]ut that did not stop the Court from declaring each of his claims ineligible." *Id.* Again, CLS disagrees with the Court's opinion in *Bilski*, which held that allowing Bilski's claims "would preempt use of [risk-hedging] in all fields ...." 130 S. Ct. at 3231.

CLS also cites *Mayo* for the proposition that "[e]ven a narrow law of nature or abstract idea is ineligible because patenting such principles still 'inhibit[s] future' development." Resp. Br. 30 (alteration in original) (quoting *Mayo*, 132 S. Ct. at 1303). But CLS twists *Mayo*'s holding—and accepting CLS's argument would effectively erase *Diehr* from the U.S. Reports. *Mayo* held that claims that would preempt *all practical uses* of a natural law are ineligible, even if the law is "narrow" in scope. 132 S. Ct. at 1303. *Diehr* holds that, although a claim to all practical uses of an abstract idea is ineligible, a claim to only *one* practical application of the idea is eligible. 450 U.S. at 187-88. The two cases are thus directed to different, but fully consistent, principles. This difference, which CLS seeks to obscure, has particular force here—where, as CLS concedes (Resp. Br. 30), Alice has not purported to claim all practical applications of the idea of intermediated settlement. See also U.S. Br. 7 (the claims "do not preempt all uses of third-party intermediaries to mitigate settlement risks"). Thus, whether intermediated settlement is a broad or narrow abstract idea (if it is an abstract idea at all), Alice has claimed at most a specific practical application of it, as permitted under *Diehr*.

Finally, CLS asks the Court to ignore the concrete limitations recited in Alice's claims by contending that each one is "[c]onventional," and therefore "add[s] no inventive concept to the abstract idea of intermediated settlement." Resp. Br. 32. CLS walks through each step of Alice's claimed method in isolation, and identifies purported prior art as to each. *Id.* at 40-46. According to CLS, this "methodology" was prescribed in *Mayo*. *Id.* at 33. CLS is wrong and, again, accepting its argument would require overruling *Diehr*.

Contrary to CLS, *Diehr* declared that novelty "*is of no relevance*" to the § 101 determination. 450 U.S. at 188-89 (emphasis added). CLS tries to avoid this statement by mischaracterizing *Diehr* as resting on a supposed finding of an "inventive contribution" in the form of "new use of a 'thermocouple.'" Resp. Br. 37 (quoting 450 U.S. at 178 & n.3). But no part of the analysis in *Diehr* depended on "new use of a 'thermocouple,'" which was not even mentioned in the claims. This Court cannot read a novelty requirement into § 101 without overruling *Diehr*.

CLS's position is also inconsistent with *Mayo*. *Mayo* explains that "the § 101 patent-eligibility inquiry and ... novelty inquiry *might sometimes* overlap." 132 S. Ct. at 1304 (emphasis added). But under CLS's approach, they must always overlap, because "inventive concept" means "novelty." This position finds no support in *Mayo*, which as Alice explained (Pet. Br. 33-35), used "inventive concept" to mean steps beyond those necessary to *any* use of the natural law. Nor is it supported by the century and a half of case law that preceded *Mayo*.

C. The Computer-Related Elements In Alice's Claims Cannot Be Ignored.

CLS acknowledges that "a programmed computer is a 'machine,'" and that Alice's claims, which are directed to computer-implemented inventions, are "formally drawn to statutory subject matter." Resp. Br. 38. Numerous *amici* underscore the point that computers are tangible machines that function in the physical world like any other machine. *E.g.*, Microsoft Br. 4 (advances in software technology "are the heirs to their mechanical forbears").[7] CLS therefore does not advocate for an approach to § 101 that would simply discount computer-implementation limitations. See Resp. Br. 37-38. However, CLS strives to minimize the significance of computer-implementation in Alice's claims with three arguments, all of them wrong.

First, CLS argues Alice's claimed method could be performed without a computer. *Id.* at 53. That is false.[8] Apart from the fact that the claim language *requires* that a computer be used in a specified way, the computer is central to the claimed inventions. Among other things, a non-computer-based implementation would not guarantee that the exchange occurs on the shadow records *simultaneously*—as required to effectively eliminate settlement risk. See Pet. Br. 48-50. Alice's invention thus uses a computer to eliminate settlement risk in a manner that materially improves on what came before. See U.S. Br. 8 (describing Alice's invention as "an improvement" that "relies for its efficacy" on use of a computer).

Second, CLS contends that the computer in Alice's claims should be ignored because it is "used conventionally." Resp. Br. 35, 39, 51-52. That position cannot be squared with 35 U.S.C. § 100(b), which provides that a patent-eligible "process" "includes a new use of a known ... machine," such as through software that configures a general-purpose computer to perform new functions, albeit by use of "conventional" computer operations. Nor can it be squared with the Court's statement in *Bilski* that use of a machine is "an important and useful clue" to patent-eligibility, without any differentiation between conventional and unconventional uses. 130 S. Ct. at 3226. In fact, Bilski's ineligible claims did not recite use of a computer (or any other machine) at all. *Id.* at 3223-24. Moreover, CLS's argument is inconsistent with *Diehr*, and is refuted by multiple *amici*. *E.g.*, IBM Br. 4; Microsoft Br. 6-8.

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[7] *See also, e.g.*, IEEE Br. 6-7, 13-14; IBM Br. 14; BSA Br. 13-14.

[8] CLS again misrepresents the testimony of Alice's expert, Resp. Br. 53, which Alice has previously addressed, Cert. Reply 9-10 n.2.

Third, CLS erroneously contends—in a footnote—that "[t]he patentability of 'software' is not presented in this case," because Alice's patents supposedly "do not explain how to configure a computer to perform the claimed methods." Resp. Br. 11 n.1 (emphasis omitted); see also Microsoft Br. 3; BSA Br. 2. But the claims set out in detail specific functions to be performed by a computer, and the specification includes supporting flowcharts. See, *e.g.*, JA383-84 (claim 33 of the '479 patent), 1023, 1031-35; see also U.S. Br. 7 (stating that the asserted claims "include a relatively detailed set of steps"). According to the PTO, that is sufficient to disclose not only *what* the recited computer should do, but *how* to do it: "[w]riting computer programming code for software to perform specific functions is normally within the skill of the art once those functions have been adequately disclosed." *Manual of Patent Examining Procedure* § 2161.01(I), at 2100-178 (rev. Aug. 2012).[9]

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[9] If the disclosure in a software patent fails adequately to instruct those of ordinary skill how to write a program to carry out the claimed method, claims may be invalid on *enablement* grounds, but not for lack of subject-matter eligibility. *See* 35 U.S.C. § 112(a).

As Alice's opening brief establishes—and neither CLS nor its *amici* refute—this manner of claiming software is not only common, but encouraged by the PTO. Pet. Br. 9-10 (citing *MPEP* § 2161.01(I), at 2100-178; *Examination Guidelines for Computer-Related Inventions*, 61 Fed. Reg. 7478, 7486 (Feb. 28, 1996) ("Applicants should be encouraged to functionally define the steps the computer will perform rather than simply reciting source or object code instructions.")). In fact, CLS's *amicus* Microsoft, in its brief in *Bilski*, correctly explained that "'software patents' generally do not actually describe software at all, but rather the process performed by a programmed computer." Microsoft Br. in *Bilski*, 13. Moreover, CLS's own patent and many of the "software patents" identified as eligible exemplars claim computer-implemented inventions in the same terms as Alice's claims. See U.S. Patent No. 8,473,401 (owned by CLS) (reciting computer components "configured to" perform various risk-intermediation functions); U.S. Patent No. 5,761,689 (cited at Microsoft Br. 10) (reciting generic computer components with "program instructions causing the computer to" perform various steps for autocorrection); U.S. Patent No. 6,405,225, cl. 16 (cited at Microsoft Br. 10) (similar); U.S. Patent No. 7,996,793, cl. 14 (cited at BSA Br. 27) (similar).

And the Court need not take Alice's word on this point. The Government asks the Court to use this case to announce a new eligibility test that is specifically and exclusively directed to computer-implemented inventions. U.S. Br. 25-33. Numerous *amici* have likewise recognized that Alice's claims are typical of software inventions, and that this case will define the law of software patentability going forward.[10] In the words of Judge Moore, "let's be clear: if all of these claims, including the system claims, are not patent-eligible, this case is the death of hundreds of thousands of patents including all … software patents." Pet. App. 85a.

II. THE COURT SHOULD REJECT THE GOVERNMENT'S COUNTER-TEXTUAL INTERPRETATION OF THE ABSTRACT IDEAS EXCEPTION.

A. The Government Seeks An Abstract Ideas Exception Inconsistent With The Statute And Precedent.

The Government recognizes that Alice's claims "do not preempt all uses of third-party intermediaries to mitigate settlement risks." U.S. Br. 7. It further recognizes that the claims require a computer, *id.* at 7; that all are literally drawn to statutory subject matter of processes, machines, and manufactures, *id.* at 8, 33; and that the claimed invention is, in sum, an improvement in business risk management that "relies for its efficacy" on a general-purpose computer configured in a particular way, *id.* at 8. This would seem to be the end of the matter under *Diehr*—the claims "do not seek to pre-empt the use" of any abstract idea as previously understood by the Court. 450 U.S. at 187.

But that is not the end of the matter. The Government would have this Court redefine the abstract ideas exception to extend to all methods and systems "which manipulate abstract concepts and relationships such as business risk, legal liability, financial transactions, and contractual obligations," or which

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[10] *See, e.g.*, IBM Br. 10; Trading Technologies Br. 1; Google Br. 26; CCIA Br. 10.

"organiz[e] human activity." U.S. Br. 15. Such claims supposedly "do not fall within patent law's traditional scope," which the Government claims is limited to "innovations in technology, science, or industry"—*i.e.*, "technological applications." *Id.* at 15-16.

The Government proposes this re-definition because it disagrees with *Bilski*. The Government argued there that "process," as used in § 101, "encompasses all technological and industrial processes, broadly conceived," but "does not extend patent-eligibility beyond those bounds, to methods of organizing human activity that are untethered to technology—*e.g.*, methods by which people conduct economic, social, or legal tasks." U.S. Br. in *Bilski*, 8. This Court rejected that argument: "Section 101 ... precludes the broad contention that the term 'process' categorically excludes business methods." *Bilski*, 130 S. Ct. at 3228.

The Government now contends that, "given the Court's holding in *Bilski* that the term 'process' in Section 101 is to be given its broad ordinary meaning, the abstract-ideas exception is the *only* available means of ensuring that patent law remains within its traditional bounds." U.S. Br. 9. Thus, undaunted by this Court's statutory interpretation, which Congress did not revisit when it amended the patent statute two years ago, the Government now presents *the very same* technological-arts argument rejected in *Bilski*, but with a different label. Because *Bilski* held that the statutory term "process" *includes* "non-technological" arts, the Government now argues that non-technological arts should nonetheless be *excluded* through a judicial exception.

This remarkable proposition deserves to be paused over. The Government argues for a broad definition of "abstract ideas," because what § 101 *actually* covers, per *Bilski*, is more than the Government would like it to cover. See *id.* at 14 n.1 (emphasizing that "the longstanding rule against patenting laws of nature and the like" is "an *exception* to [§ 101's] literal coverage," not "an *interpretation* of Section 101"). Effectively, the Government is asking this Court to amend § 101 so that it conforms to the current policy preferences of the Executive Branch—what it refers to as the "traditional bounds" of patent law.

This approach is inconsistent with both § 101 and this Court's precedents. In *Bilski*, for example, the Court left no doubt that interpretation of § 101 is constrained by standard statutory construction principles. To be sure, the Court recognized that judicially created "exceptions are not required by the statutory text," but explained that they are "*consistent with* the notion that a patentable process be 'new and useful.'" 130 S. Ct. at 3225 (emphasis added) (quoting § 101). In other words, while the three exceptions are not required by the text, they reflect a longstanding judicial gloss that is fully consistent with the text, see, *e.g.*, *Bruesewitz* v. *Wyeth LLC*, 131 S. Ct. 1068, 1082 (2011), and do not liberate the judiciary to depart further from Congress's chosen language, *Bilski*, 130 S. Ct. at 3226. Here, because the Government's approach finds no support in precedent, and departs from the statutory text, it must be rejected.

Similar flaws undercut the Government's request that this Court announce a rule specific to computer-implemented inventions. See U.S. Br. 8. The Government asks this Court to hold that claims that use general-purpose computers to perform "standard computing functions" are ineligible. *Id.* at 9-10. Improvements in a computer's operation as a computer may be eligible, the Government says, because "they represent non-abstract technological innovations that fall within the traditional scope of the patent laws," *id.* at 10, but where a claim uses a computer to perform a new function that does not represent an advancement in computing *per se*, it is not eligible.

Nothing in the statute or this Court's precedent supports the distinction the Government would draw. To the contrary, § 100(b) expressly provides that the statutory definition of "process" "includes a new use of a known ... machine"—such as new use of a known general-purpose computer through software that brings about new configurations of electronic circuits to perform new functions. Moreover, ignoring claim limitations requiring use of a computer is directly contrary to *Diehr*'s instruction that claims be considered "as a whole," and that it is "inappropriate to dissect the claims" and "ignore the presence" of individual elements. 450 U.S. at 188. Notably, the Government not only makes no effort to reconcile its approach with § 100(b) and *Diehr*, but includes no meaningful discussion of those authorities at all.

It is impossible to reconcile the Government's proposals with any concept of separation of powers, or statutory construction. It proposes a pure policy judgment completely untethered from the statutory text and the Court's precedent.

B. The Government's Approach Would Make Bad Policy.

Apart from directing its policy proposals to the wrong forum, the Government's redefinition of the abstract ideas exception is misguided.

First, the Government is wrong to assert that expansion of the abstract ideas exception is necessary to "police[] the appropriate bounds of patent law."

U.S. Br. 16. As the Government argued in *Mayo*, and also in this case below, § 101 is by design a "'coarse filter,'" and the PTO is better equipped to use the other limits on patentability—§§ 102, 103, and 112—than it is to implement § 101. U.S. Br. in *Mayo*, 11; U.S. Fed. Cir. Br. 20. While the Government now downplays the other statutory requirements, U.S. Br. 15, its protests are unconvincing. The other statutory sections—in particular §§ 103 and 112—have substantial force in policing computer-implemented inventions. See, *e.g.*, Pet. Br. 42-43 (citing, *inter alia*, Exec. Office of the President, *Patent Assertion and U.S. Innovation* 7-8, 13 (June 2013), *available at* http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf); IBM Br. 26-30.

Second, accepting the Government's computer-specific rule would have a devastating impact in the software industry. Under the Government's test, most computer-implemented inventions (*e.g.*, software) are ineligible for patenting, because the vast majority of software is designed for use on a computer performing "standard computing functions." U.S. Br. 9-10. And the list of ineligible claims would include not only computer-implemented inventions in the financial and business sectors, but would extend across industries. See, *e.g.*, Robin Cook & Eric Topol, *How Digital Medicine Will Soon Save Your Life*, Wall St. J. (Feb. 22, 2014), at A17 (describing a series of computer-implemented health care innovations, at least some of which the Government would reject). Computers are used to perform "standard computing functions" in a host of fields of human activity, without altering the operation of the computers as computers. Judge Moore's prediction that the plurality's approach would call into question hundreds of thousands of patents pales in comparison to the harm the Government's approach would inflict. It would undercut innovation in industries that are vital not only to the economy, but to public health, industry, and science, as well.

III. THE COURT SHOULD ARTICULATE A CLEAR STANDARD FOR THE ABSTRACT IDEAS EXCEPTION CONSISTENT WITH THE TEXT OF § 101.

A clear standard for § 101 is needed. Pet. Br. 53-55. Section 101 is intended to be "only a threshold test," *Bilski*, 130 S. Ct. at 3225, yet the doctrine has "fail[ed] in the computer-implemented invention context." IBM Br. 14; see also Michel Br. 7 (the abstract ideas exception "sets out a dangerous road to travel").

Accepting CLS's approach will not provide this "needed guidance." U.S. Br. 9. Indeed, CLS makes no effort to articulate a clear standard, but instead seeks to recast the question presented as "Whether the courts below correctly concluded that all of the asserted claims are not patent-eligible." Resp. Br. *i*. That is not, of course, the question this Court agreed to consider—and not the question that the lower courts, the PTO, and the computer industry badly need this Court to answer.

Moreover, CLS would have the Court answer its restated question based on a distorted reading of Alice's claims and a distorted presentation of the facts. Thus, CLS engages in baseless attacks, declaring that Alice is "what is commonly known as a non-practicing entity or a patent-assertion entity," and that Alice "wants to use its patents to hold hostage a systemically important financial institution." *Id.* at 3, 55. In CLS's hyperbolic words, "For the price of a patent application, Alice is putting at risk

CLS's billion-dollar investment—and with it the largest financial market in the world." *Id.* at 55. CLS further speculates that "if these patents were to be resurrected, Alice could assert them against virtually every financial institution." *Id.* at 55-56.

None of this is true. Alice is not a "patent-assertion entity," but a company founded by Ian Shepherd, *the inventor* of the claimed systems, methods, and media. Alice has never sought an injunction barring CLS from using its own technological solution. And Alice has not asserted its patents against "virtually every financial institution," but only one—CLS—*after CLS sued it*.

In any event, none of CLS's assertions has any relevance to § 101. Indeed, it is telling that CLS views these supposed facts—and the facts it says show that individual claim limitations are "conventional," *id.* at 40-46—as having some bearing on the eligibility of Alice's claims. As CLS's argument makes clear, its approach would transform § 101 from a threshold legal test into a fact-intensive inquiry that will require extensive discovery, expert testimony, and all of the other burdens of litigation that CLS and its *amici* claim they want to prevent.

CONCLUSION

The Court should reverse the judgment below and remand the case for further proceedings.

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ALICE CORPORATION PTY. LTD., PETITIONER

v.

CLS BANK INTERNATIONAL, ET AL.

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

BRIEF FOR THE UNITED STATES AS AMICUS CURIAE IN SUPPORT OF RESPONDENTS

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QUESTION PRESENTED

Whether petitioner's computer-implemented claims for mitigating financial risk by using a third-party intermediary are eligible for patent protection under 35 U.S.C. 101.

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In the Supreme Court of the United States

No. 13-298

ALICE CORPORATION PTY. LTD., PETITIONER

v.

CLS BANK INTERNATIONAL, ET AL.

ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

BRIEF FOR THE UNITED STATES AS AMICUS CURIAE IN SUPPORT OF RESPONDENTS

INTEREST OF THE UNITED STATES

This case presents the question whether petitioner's claimed systems and methods for using a general-purpose computer to conduct financial transactions in a manner that reduces settlement risk are patent-eligible, or are instead directed to an unpatentable abstract idea. The Court's resolution of that question will significantly affect the work of the United States Patent and Trademark Office (PTO), which is responsible for issuing patents and advising the President on issues of patent policy. See 35 U.S.C. 2(a)(1) and (b)(8). The United States therefore has a substantial interest in the Court's disposition of this case.

STATEMENT

1. Section 101 of Title 35 of the United States Code provides that an inventor may obtain a patent on "any

new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. 101. Congress cast the provision in broad terms in order "to ensure that ingenuity should receive a liberal encouragement." *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3225 (2010) (quoting *Diamond* v. *Chakrabarty*, 447 U.S. 303, 308 (1980)). Section 101 is subject, however, to an "important implicit exception": "[l]aws of nature, natural phenomena, and abstract ideas are not patentable." *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012) (quoting *Diamond* v. *Diehr*, 450 U.S. 175, 185 (1981)). "The concepts covered by these exceptions are 'part of the storehouse of knowledge of all men . . . free to all men and reserved exclusively to none.'" *Bilski*, 130 S. Ct. at 3225 (quoting *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)).

2. Petitioner is the assignee of United States Patent Nos. 5,970,479 (the '479 patent), 6,912,510 (the '510 patent), 7,149,720 (the '720 patent), and 7,725,375 (the '375 patent). Pet. App. 2a-3a. The patents, which share a common specification, disclose schemes for managing forms of business risk. *Id.* at 3a. The specification explains that the "invention relates to methods and apparatus, including electrical computers and data processing systems applied to financial matters and risk management." J.A. 1115.

The claims at issue in this case concern a computerized scheme for mitigating settlement risk in the exchange of financial obligations. Pet. App. 3a. The claims are designed to facilitate an agreed-upon exchange between two parties by using an independent third-party intermediary that monitors electronic "shadow" credit and debit accounts to track the parties' ability to perform at settlement. The shadow records reflect the balances in the parties' real-world accounts, and the intermediary updates them in real time as transactions are entered, "permitting only those transactions for which the parties' updated shadow records indicate sufficient resources to satisfy their mutual obligations." *Id.* at 27a-28a. At the end of the day, the intermediary instructs the appropriate institutions to exchange credits and debits in the parties' real-world accounts to effect the permitted transactions. The intermediary's participation in this manner mitigates the risk that only one party will perform the agreed-upon exchanges. *Id.* at 28a.

The patents recite a method of exchanging obligations between parties, a computer system configured to perform the process, and a computer-readable medium containing program code for directing an exchange of obligations. Pet. App. 3a. The system and media claims expressly recite a computer, and the parties have stipulated that the method claims similarly require the use of a computer. *Id.* at 28a. The specification explains that "[t]he resources transferred by [the parties] may be of any type," J.A. 1176, and that the invention can be used by a wide variety of transfer entities, including commercial and central banks and non-bank clearing houses, *ibid.*

3. In 2007, respondents filed suit against petitioner, seeking a declaratory judgment that the claims are invalid, unenforceable, and not infringed. Pet. App. 4a. Petitioner counterclaimed for infringement. *Ibid.* Respondents eventually sought summary judgment on the ground that the asserted patent claims are directed to an abstract idea and therefore are invalid under Section 101. *Id.* at 4a-5a, 26a.

a. The district court held that all of the asserted claims are patent-ineligible under Section 101 because they describe the abstract economic idea of "employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk." Pet. App. 214a; see *id.* at 172a-238a.

b. A divided panel of the Federal Circuit reversed. Pet. App. 132a-171a. The panel held that petitioner's claims were patent-eligible because it is not "manifestly evident" that they are directed to an abstract idea. *Id.* at 152a.

c. The court of appeals granted rehearing en banc. In a one-paragraph per curiam opinion, the court affirmed the judgment of the district court. Pet. App. 1a-2a. Seven of the ten participating judges agreed that petitioner's method and media claims are patent-ineligible. See *ibid.*; *id.* at 3a n.1. With respect to petitioner's system claims, the en banc court affirmed the district court's judgment by an equally divided vote. *Id.* at 2a.

Writing for a five-member plurality, Judge Lourie explained that petitioner's method claims draw on the abstract idea of reducing settlement risk by facilitating a trade through a third-party intermediary. Pet. App. 2a-41a; *id.* at 28a. In the plurality's view, under *Bilski* and *Mayo*, *supra*, a court must first identify "the abstract idea represented in the claim," *id.* at 28a, and then ascertain whether the elements of the claim add "significantly more" to the abstract idea, *id.* at 29a; see *Bilski*, 130 S. Ct. at 3231; *Mayo*, 132 S. Ct. at 1300. The plurality concluded that petitioner's claims "draw on the abstract idea of reducing settlement risk by effecting trades through a third-party intermediary," Pet. App. 28a, without adding "anything of substance" to that idea, *id.* at 29a. The plurality further held that, although petitioner's system and media claims "nominally recite[] as [their] subject matter a physical device," they are in substance drawn to the underlying method of reducing settlement risk. See *id.* at 33a-34a, 36a-40a.

Chief Judge Rader concurred in part and dissented in part. Pet. App. 41a-85a. In a part of his opinion joined only by Judge Moore, Chief Judge Rader concluded that petitioner's method claims are abstract. *Id.* at 84a. Because petitioner had conceded that its media claims "rise or fall with the method claims," Chief Judge Rader concluded without separate analysis that the media claims are also abstract. *Id.* at 81a. In a part of the opinion also joined by Judges Linn and O'Malley, Chief Judge Rader found that petitioner's system claims are patent-eligible. *Id.* at 69a-80a, 84a. He concluded that the components of the claims —including a computer and a data storage unit—are "structural elements" that are "additional steps to an escrow, not inherent in it." *Id.* at 78a.

Judge Moore wrote a separate opinion dissenting in part, joined by Chief Judge Rader and Judges Linn and O'Malley, arguing that petitioner's system claims are patent-eligible. Pet. App. 85a-99a. Judge Newman, *id.* at 99a-113a, and Judges Linn and O'Malley, *id.* at 113a-126a, filed dissenting opinions that would have held all of the asserted claims patent-eligible. Chief Judge Rader filed a separate opinion offering additional thoughts on Section 101. *Id.* at 126a-131a.

SUMMARY OF ARGUMENT

I. This Court has long held that abstract ideas, like laws of nature and natural phenomena, are not patent-eligible under 35 U.S.C. 101. In *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010), the Court held that these limitations on patent-eligibility do not categorically exclude improved methods of doing business. The Court recognized, however, that the abstract-ideas exception will preclude patents directed to the manipulation of fundamental economic concepts.

Given the increasingly pervasive use of computers in all areas of human endeavor, application of the abstract-ideas exception to computer-implemented inventions has taken on particular importance. The exception poses no barrier to patents on technological innovations that improve computers' ability to function as such. But when the applicant seeks at bottom to patent purported improvements in the conduct of financial transactions, the recitation of a computer for its standard functions is insufficient to render the invention patent-eligible.

The Court in *Bilski* inferred, from the existence of a statutory defense specific to business-method patents, that Congress assumed the validity of at least some such patents. After the decision in *Bilski*, however, Congress repealed the language on which the Court had relied. And while Congress simultaneously established a process for PTO review of non-technological business-method patents, Congress expressly discountenanced any inference that such methods are patent-eligible.

Contrary to petitioner's contentions, the abstract-ideas exception is not limited to patent claims that recite a mathematical formula or a preexisting truth about the natural world. Nor is the exception limited to abstract ideas that are expressed at a high level of generality. Even when a claimed non-technological method of performing financial transactions or overseeing economic relationships is highly specific, its function still is to manipulate abstract concepts, and it is accordingly patent-ineligible.

II. Petitioner's method claims are drawn to an abstract idea. Considered apart from any computer implementation, the method claims are addressed to the manipulation of abstract legal and economic concepts. Although the claims include a relatively detailed set of steps, and therefore do not preempt all uses of third-party intermediaries to mitigate settlement risks, this Court has not limited the abstract-ideas exception to ideas expressed at a high level of generality.

The method claims' incorporation of a computer does not render them patent-eligible. Petitioner's invention addresses the management of financial risk, an area of endeavor that has historically been viewed as outside the patent laws. And the claimed methods do not involve any improvement in the ability of a computer to function as such, but instead utilize preexisting computer technology solely for its established generic functions.

III. Petitioner's system and media claims rise or fall with its method claims. This Court has made clear that, when a patent on a particular series of steps would amount in practical effect to a patent on a law of nature or abstract idea, the patent is invalid, even though the series of steps constitutes a Section 101 "process." The same analysis applies to petitioner's system and media claims, which are in substance efforts to patent a method of organizing human economic activity, even though they are drawn to what are literally a "machine" and a "manufacture."

ARGUMENT

This case presents the question whether an improvement in business risk management that relies for its efficacy on a general-purpose computer is patent-eligible. As a plurality of this Court recognized in *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3229 (2010), the pervasive use of computers has the potential to vastly expand the scope of patent law. Historically, the patent system was thought to protect only technological, scientific and industrial inventions, and patents on methods of doing business or organizing human activity were "rarely granted." *Id.* at 3227. But as a plurality of the *Bilski* Court observed, computers have "enable[d] the design of protocols for more efficient performance of a vast number of business tasks," *id.* at 3229, and there are few if any fields of human endeavor in which computers cannot be used. If the use of a computer were sufficient to confer patent-eligibility under Section 101, patent protection could extend to innovations in such fields as financial, legal, and educational concepts and systems. As a result, the patent system would sweep far beyond its traditional domain of technological, scientific, and industrial progress.

The Federal Circuit's decisions interpreting Section 101 have often reflected that sweeping understanding of the patent laws. See, *e.g.*, *State St. Bank & Trust Co.* v. *Signature Fin. Grp., Inc.*, 149 F.3d 1368 (1998), cert. denied, 525 U.S. 1093 (1999). And the PTO, bound by those decisions, has issued patents claiming beneficial uses of general-purpose computers in nearly every conceivable field of human endeavor, including the patents at issue in this case.

The Court's recent decisions in *Bilski* and in *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012), however, indicate that the previous approach, though it had the benefit of ease of administration, is no longer viable. In holding that a method of hedging transaction risk was not patent-eligible, the *Bilski* plurality made clear that the spread of computers into traditionally non-technological fields of human endeavor is a reason to be vigilant in enforcing the traditional limits on patent-eligibility. 130 S. Ct. at 3229. The plurality further stated that the abstract-ideas exception to Section 101 provides a "useful tool[]" with which to enforce such limits. *Ibid.* And in *Mayo*, the Court established that the elements of a claim must add more than routine, well-understood steps to an unpatentable natural law or abstract idea. 132 S. Ct. at 1298. That logic applies equally in assessing whether a claim's incorporation of a computer renders it patent-eligible. See *id.* at 1300.

To provide needed guidance to PTO's more than 8000 patent examiners, and to ensure that the patent laws are not extended beyond their proper scope, the Court should hold that claims directed to the manipulation of abstract concepts or relationships, such as methods of organizing transactions and other human activities, are patent-ineligible under the abstract-ideas exception to Section 101. Indeed, given the Court's holding in *Bilski* that the term "process" in Section 101 is to be given its broad ordinary meaning, the abstract-ideas exception is the *only* available means of ensuring that patent law remains within its traditional bounds. The Court should further hold that an otherwise-abstract claim does not become patent-eligible merely because it incorporates a general-purpose computer to perform standard computing functions. By contrast, claims directed to improvements in a computer's operation as a computer are patent-eligible, as they represent non-abstract technological innovations that fall within the traditional scope of the patent laws.

I. THE EXCEPTION FOR ABSTRACT IDEAS PRECLUDES PATENT PROTECTION FOR INNOVATIONS IN THE MANIPULATION OF NON-PHYSICAL CONCEPTS, SUCH AS IMPROVEMENTS TO FINANCIAL AND BUSINESS TRANSACTIONS

A. Under *Bilski*, The Abstract-Ideas Exception Is Patent Law's Sole Mechanism For Excluding Claims Directed To Manipulation Of Non-Technological Concepts And Relationships

1. This Court first explicated the rule that "abstract intellectual concepts are not patentable" in a series of decisions involving the patent-eligibility of processes that relied on mathematical algorithms. *Gottschalk* v. *Benson*, 409 U.S. 63, 67 (1972). In *Benson* and a subsequent case, *Parker* v. *Flook*, 437 U.S. 584 (1978), the Court explained that a mathematical algorithm or equation—which the Court defined as a "procedure for solving a given type of mathematical problem," 409 U.S. at 65—is not patent-eligible because "[a] principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Id.* at 67 (citation omitted); see *Flook*, 437 U.S. at 589. Such equations are "abstract" in the sense that, like "mental processes" and "[p]henomena

of nature," they are "the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67.

The Court held that the claimed processes in both cases were invalid. In *Benson*, the Court explained that, although the claimed process was designed to be used on a computer, the "formula involved here has no substantial practical application except in connection with a digital computer," and the patent therefore was "in practical effect * * * a patent on the algorithm itself." 409 U.S. at 71-72. Similarly in *Flook*, the Court held that, although the patent claimed the use of the equation only in particular industries, field-of-use restrictions were insufficient to "transform an unpatentable principle into a patentable process." 437 U.S. at 590. The Court further explained that insignificant "post-solution activity," such as a general instruction to apply the equation, is likewise insufficient. *Ibid.* Otherwise, patent applicants would be able to circumvent the prohibition on patenting abstract ideas by appending insignificant limitations to the idea itself. *Ibid.* In *Diamond* v. *Diehr*, 450 U.S. 175, 185-188 (1981), by contrast, the Court held that the claimed process was patent-eligible because it incorporated a mathematical formula into a larger and specifically defined industrial process.

2. The Court next considered the abstract-ideas exception in *Bilski*. The Court in *Bilski* described the principle that abstract ideas, laws of nature, and physical phenomena are not patentable as an "exception" to Section 101's "broad patent-eligibility principles." 130 S. Ct. at 3225. "Concerns about attempts to call any form of human activity a 'process' can be met," the Court stated, "by making sure the claim meets the

requirements of [Section] 101" and does not fall within one of the "well-established exceptions." *Id.* at 3226.

In *Bilski*, the government argued that the term "process" in Section 101 should be construed as a statutory term of art limited to methods that employ a machine or effect a transformation of matter. Under the machine-or-transformation test, only those processes that describe an applied technological, scientific, or industrial innovation would be patent-eligible, while processes directed to methods of organizing human activity—for which patents historically had been "rarely granted"—would not be. 130 S. Ct. at 3227 (plurality opinion). In holding that the machine-or-transformation test is not "the sole test for deciding whether an invention is a patent-eligible 'process,'" the Court concluded that the text of Section 101 did not suggest such a limitation, and it expressed concern that the test might have unpredictable results when applied to innovations in computing techniques. *Ibid.* The Court also rejected the related argument that "business methods" should be "categorically exclude[d]" from patent-eligibility under Section 101. *Id.* at 3228. The Court thus held that the term "process" should be given its broad "ordinary * * * meaning." *Ibid.* (citation omitted).

The Court in *Bilski* left little doubt, however, that most methods of conducting business will not be patent-eligible. The Court emphasized that "the machine-or-transformation test is a useful and important clue * * * for determining whether some claimed inventions are processes." 130 S. Ct. at 3227. The Court also stated that the "well-established exceptions" for "laws of nature, physical phenomena, and abstract ideas" should be used to vindicate the policy concerns that animated the machine-or-transformation test: courts may "restrict[] business method patents" through means that "includ[e] (but [are] not limited to) application of our opinions in *Benson*, *Flook*, and *Diehr*." *Id.* at 3226, 3231.

The plurality was even more explicit about the pivotal role of the abstract-ideas exception in policing the boundaries of patent-eligibility. "[T]his Court's precedents on the unpatentability of abstract ideas provide useful tools," the plurality stated, in constructing "a limiting principle" to ensure that not all methods of performing "business tasks" more efficiently through "mathematical calculations" are patent-eligible. *Bilski*, 130 S. Ct. at 3229. The plurality observed that, "if the Court of Appeals were to succeed in defining a narrower category or class of patent applications that claim to instruct how business should be conducted, and then rule that the category is unpatentable because * * * it represents an attempt to patent abstract ideas, this conclusion might well be in accord with controlling precedent." *Ibid.* Just as claims to mathematical equations threaten to tie up the building blocks of scientific and technical inquiry, *Flook*, 437 U.S. at 589-590, claims to non-concrete ideas about how to organize business transactions may inhibit innovations in business-related technologies as well as commercial endeavors, *Bilski*, 130 S. Ct. at 3229 (plurality opinion).

The abstract-ideas exception reconciles *Bilski*'s holding that the term "process" in Section 101 has its ordinary meaning, see 130 S. Ct. at 3226, 3228, with the Court's statement that the machine-or-transformation test remains a "important and useful clue" to the patent-eligibility of an invention framed as a process, *id.* at 3226. Patent claims that fail the machine-or-transformation test because they are directed to methods of organizing human activity rather than technological, scientific, and industrial innovations are likely to be invalid under the abstract-ideas exception because they are directed to intellectual concepts and their manipulation.[1]

That understanding of the abstract-ideas exception is reflected in the Court's conclusion that Bilski's claims, which described a method of managing the consumption risk costs of commodities by arranging transactions whose risks offset each other, were directed to an abstract idea. *Bilski*, 130 S. Ct. at 3231. In arguing that Bilski's claims failed the machine-or-transformation test, the government's brief explained that the claims pertained to manipulation of legal and financial obligations or relationships, and that "merely adding the extra detail that a computer would be used to calculate the fixed rates" would constitute "insignificant extra-solution activity." 08-964 U.S. Br. 52-53. Rather than adopting the government's proposed limiting construction of the Section 101 term "process," the Court instead dealt with the eligibility issue under the abstract-ideas exception. The Court concluded that the claims—both the broad description of the steps in Claim 1 and the reduction of that claim to a mathematical formula in Claim 4—were directed to an abstract idea because they "explain the basic concept of hedging," a "fundamental economic practice." 130 S. Ct. at 3231 (citation omitted).

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[1] In *Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980), the Court noted that "[t]he laws of nature, physical phenomena, and abstract ideas have been held not patentable." *Id.* at 309. The Court also cautioned, however, that courts "should not read into the patent laws limitations and conditions which the legislature has not expressed." *Id.* at 308 (quoting *United States* v. *Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933)). Those statements taken together might suggest that the longstanding rule against patenting laws of nature and the like reflects an *interpretation* of Section 101 and its statutory predecessors, rather than an *exception* to the provision's literal coverage. *Bilski* and *Mayo*, however, have clarified that the rule functions as a judicially-created exception, which may apply even to a series of steps that constitutes a Section 101 "process."

B. The Abstract-Ideas Exception Encompasses Claims That Manipulate Abstract Concepts Rather Than Disclosing Concrete Innovations In Technology, Science, Or the Industrial Arts

1. The abstract-ideas exception encompasses the mathematical equations and other fundamental building blocks of technological advancement at issue in *Benson* and *Flook*, as well as the methods and systems at issue in *Bilski* and in this case, which manipulate abstract concepts and relationships such as business risk, legal liability, financial transactions, and contractual obligations. Indeed, given *Bilski*'s holding that the term "process" broadly encompasses business methods and the like, the abstract-ideas exception is patent law's *only* mechanism for excluding claims to non-technological methods of organizing human activity. Many methods of manipulating abstract concepts —such as methods of defending a lawsuit or learning an aria—may satisfy the Patent Act's other requirements for patentability, such as novelty and nonobviousness. But those claims do not fall within patent law's traditional scope, and it is the abstract-ideas exception to Section 101 that provides a means of excluding them from patent protection.

Conversely, the abstract-ideas exception should not encompass innovations in technology, science, or industry as such, *e.g.*, inventions that improve the way computers function, including those "based on linear programming, data compression, and the manipulation of digital signals." *Bilski*, 130 S. Ct. at 3227 (plurality opinion). Those inventions should be patent-eligible because they disclose concrete technological applications and fall within patent law's traditional bailiwick of the scientific, technological, and industrial arts. That is so even if an advancement in computing technology is not grounded in "tangible form," *ibid.*, and even if its primary utility is in developing computers or other technology to better facilitate business or financial activities.

While patents on methods of organizing human business and financial activity historically were rarely granted, today those sorts of processes often contemplate or require the use of a computer. "The Information Age empowers people with new capacities to perform statistical analyses and mathematical calculations with a speed and sophistication that enable the design of protocols for more efficient performance of a vast number of business tasks." *Bilski*, 130 S. Ct. at 3229 (plurality opinion). Now that computers are often used as assistive technology in otherwise nontechnological fields of human activity, it is all the more important that traditional limits on patent eligibility be rigorously enforced. "If a high enough bar is not set when considering patent applications of this sort, patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change." *Ibid.* Thus, in order to apply the abstract-ideas exception in a manner that polices the appropriate bounds of patent law, PTO and reviewing courts must distinguish between methods that disclose technological, scientific, or industrial innovations and methods that are directed to organizing abstract concepts and relationships using a computer.[2] See Part II, *infra*.

2. That understanding of the scope and substance of the abstract-ideas exception best effectuates congressional intent.

a. In rejecting "[t]he argument that business methods are categorically outside of [Section] 101's scope," the Court in *Bilski* stated that "federal law explicitly contemplates the existence of at least some business method patents." 130 S. Ct. at 3228. The Court based that inference on former 35 U.S.C. 273(b)(1), which provided persons accused of infringing "a method of doing or conducting business" with a special "defense of prior use." 130 S. Ct. at 3228; see also 35 U.S.C. 273(a)(3) (2006). That provision had been enacted in response to the Federal Circuit's decision in *State Street Bank*, *supra*, which Congress understood as allowing patent protection for some inventions related to financial and business services that had not previously been thought to be patent-eligible. See H.R. Rep. No. 287, 106th Cong., 1st Sess. 46-47 (1999). In 2011, however, as part of the Leahy-Smith America Invents Act (AIA), Pub. L. No. 112-29, 125 Stat. 284, Congress overhauled the prior-use defense and repealed the language on which this Court had relied, so that Section 273 no longer refers to business methods. See 35 U.S.C. 273.

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[2] The European patent system has come to rest on a similar understanding of the patentability of business innovations, albeit by a different doctrinal route. Article 52 of the *European Patent Convention* provides that "European patents shall be granted for any inventions, in all fields of technology," but it expressly excludes non-technical "methods for * * * doing business." European Patent Office (EPO), *European Patent Convention* art. 52(1) and (2)(c), at 110 (15th ed. 2013). Methods that offer "a technical solution of a technical problem"—and therefore are not aimed solely at organizing human activity—fall outside this exception. See EPO, *T154/04 Method of Estimating Product Distribution* ¶ 20, at 37 (Nov. 15, 2006). In assessing whether a computerized method of doing business includes an inventive step (*i.e.*, is not obvious), moreover, the European system disregards the business aspects and considers only the technical aspects of the claimed invention. See *id.* ¶ 28.

b. The AIA also created a new procedure to facilitate administrative challenges to the validity of business-method patents, including under Section 101. Section 18 of the AIA created the "Transitional Program for Covered Business Method Patents" (CBM Program), which permits persons accused of infringing non-technological business-method patents to obtain reconsideration by PTO of the validity of the asserted claims. See § 18, 125 Stat. 329, 331. The "covered business method patent[s]" that may be challenged are defined as "method[s] or corresponding apparatus[es] for performing data processing or other operations used in the practice, administration, or management of a financial product or service"; but the term excludes "patents for technological inventions." § 18(d)(1), 125 Stat. 331.

The CBM Program provides an inexpensive alternative to litigation for addressing the validity of business-method patents. See H.R. Rep. No. 98, 112th Cong., 1st Sess. 54 (2011) (discussing "poor" quality business-method patents that began to be issued in the late 1990s); 157 Cong. Rec. S1379 (daily ed. Mar. 8, 2011) (statement of Sen. Kyl). In particular, the bill's sponsors anticipated that non-technological business-method patents would be subject to eligibility challenges under *Bilski*, and they emphasized that the CBM Program would provide a forum for those challenges. See, *e.g.*, *ibid.* (noting the "expectation that most if not all true business-method patents are abstract and therefore invalid in light of the Bilski decision"); *id.* at S1363 (statement of Sen. Schumer) (In "Bilski v. Kappos, the Court * * * made clear that abstract business methods are not patentable."). Indeed, PTO's Patent Trial and Appeal Board has held that several patents challenged in the CBM Program are directed to abstract ideas and therefore are invalid. See, *e.g.*, *CRS Advanced Techs. Inc.* v. *Frontline Techs. Inc.*, Case CBM2012-00005, at 8-17 (P.T.A.B. 2014) (claims to method of human-resources management using a general-purpose computer system were invalid abstract ideas).

In defining covered business methods as claims to "data processing or other operations" used in connection with financial services, Congress recognized that business-method patents may be subject to validity challenges even if they incorporate a computer. AIA § 18(d)(1), 125 Stat. 331. At the same time, "technological inventions" are excluded from the program, presumably because there is no comparable need to provide a ready administrative means of challenging such preexisting patents. See *ibid.*; 37 C.F.R. 42.301 (in determining whether a patent is "technological," PTO will consider whether as a whole it recites a "technological feature" that is novel and unobvious over prior art and whether it represents a "technical solution"); see also 157 Cong. Rec. at S1379 (CBM Program distinguishes between "abstract business concepts and their implementation, whether in computers or otherwise," and advances in computer technology).

Furthermore, in enacting the CBM Program, Congress sought to ensure that the program's existence and its definition of "covered business method patent" would not be read to indicate an intent that abstract methods of organizing business and financial activity are patent-eligible. Section 18(e) of the AIA states that "[n]othing in this section shall be construed as amending or interpreting categories of patent-eligible subject matter set forth under section 101 of title 35." § 18(e), 125 Stat. 331. Thus, in the same law that repealed the Section 273 language from which the *Bilski* Court had inferred the potential patent-eligibility of business methods, Congress directed future courts not to draw a similar inference from the establishment of the CBM Program.[3]

C. Petitioner's Understanding Of The Abstract-Ideas Exception Is Mistaken

1. Petitioner advocates an unduly narrow understanding of the abstract-ideas exception. Petitioner contends (Br. 22) that the term "abstract idea" in this Court's precedents functions exclusively as "a synonym for a fundamental truth—a preexisting concept analogous to a law of nature," such as "a mathematical formula or relationship." In petitioner's view, mathematical formulas are unpatentable because they "exist[] in principle apart from any human action." Br. 26

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[3] Even if all or most of the processes that fall within the AIA's definition of "covered business method patent" are patent-ineligible, Section 18 is not superfluous. Congress was aware that many such patents have been granted, see pp. 8-9, 17-18, *supra*, and the CBM Program provides parties accused of infringing such patents with an inexpensive alternative to litigating validity in court.

(quoting *Mayo*, 132 S. Ct. at 1297). Although *Diehr*, *Flook*, and *Benson* confirm that mathematical formulas are unpatentable abstract ideas, petitioner's argument cannot be squared with *Bilski*, and it does not adequately account for the variety of ways in which mathematical formulas may be derived and used.

One of Bilski's claims involved the use of an equation that employed particular variables and coefficients said to constitute an efficient method of hedging weather-related risk. In holding that the abstract-ideas exception applied, however, the Court did not suggest that the claimed method of hedging risk in energy markets was a preexisting truth akin to a law of nature. See 130 S. Ct. at 3231. Rather, the Court described Bilski's application as an attempt to patent the "basic concept of hedging," *i.e.*, a "fundamental economic practice." *Ibid.* (citation omitted); see *id.* at 3236 (Stevens, J., concurring in the judgment). Although hedging has long been used in "our system of commerce," *id.* at 3231 (citation omitted), it is nevertheless a human innovation, not a preexisting "truth" about the natural world whose "existence" must be "discover[ed]." Pet. Br. 22. The Court's emphasis on the usefulness of the abstract-ideas exception as a "means of restricting business method patents," 130 S. Ct. at 3231, moreover, indicates that the Court did not rely narrowly on the application's use of a formula or conceive of Bilski's claimed process as akin to a fundamental truth.

Petitioner's effort to analogize all abstract ideas to laws of nature, see Br. 22, 44, also fails to account for the variety of relationships that can be expressed in mathematical form. Some formulas, such as $E=mc^2$, are designed to describe a natural phenomenon or "preexisting concept analogous to a law of nature." Pet. Br. 22. But other mathematical expressions—such as Bilski's equation, or the sabermetric formula that measures a baseball player's relative offensive prowess using the sum of his on-base and slugging percentages, see, *e.g.*, Michael Lewis, *Moneyball* 80, 128 (2003)—do not seek to describe preexisting natural phenomena. Formulas like those do not "exist[] in principle apart from any human action," Pet. Br. 26 (quoting *Mayo*, 132 S. Ct. at 1297), and their worth depends on their utility in solving human problems, not on how accurately they describe preexisting phenomena. Although the Court has described mathematical formulas as unpatentable in part because they may "reveal[] a relationship that has always existed," *Flook*, 437 U.S. at 593 n.15; see Pet. Br. 22, the Court has never suggested that patent eligibility turns on whether or not a particular formula describes a preexisting phenomenon. See *Flook*, 437 U.S. at 589 (formulas are abstract because they are "conception[s] of the mind, seen only by [their] effects when being executed or performed") (brackets in original; citation omitted). The Court's decision in *Bilski*, by holding the abstract-ideas exception applicable to Bilski's claimed hedging method and his accompanying mathematical formula, makes clear that the exception is not limited to preexisting concepts analogous to laws of nature.

2. Petitioner also argues (Br. 27-29, 35-36) that, if a "disembodied concept" is recited in the form of a process, machine, or other statutory subject matter, it is necessarily not an abstract idea, but instead a practical application of that idea. Petitioner is correct that, even without any judicially-created exceptions to patent-

eligibility, a disembodied concept standing alone would be ineligible for patent protection because it falls outside the literal scope of Section 101. See *Benson*, 409 U.S. at 67. The whole point of the judicial exceptions, however, is to preclude patent protection for certain purported inventions that *do* constitute "processes," "machines," or the like. See *Flook*, 437 U.S. at 593. In *Mayo*, for example, the Court did not dispute that the claimed methods were "processes" as the Court had construed that term in *Bilski*. Rather, the Court explained that, "[i]f a law of nature is not patentable, then neither is a process reciting a law of nature, unless that process has additional features that provide practical assurance that the process is more than a drafting effort designed to monopolize the law of nature itself." *Mayo*, 132 S. Ct. at 1297. Thus, a claim that recites a "machine" or "process" must still contain additional elements that go beyond insignificant extra-solution activity or field-of-use restrictions, such that they meaningfully add to or limit the abstract idea. See *id.* at 1294 (claim must not "too broadly preempt the use of" the abstract idea); *Bilski*, 130 S. Ct. at 3229-3230 (plurality opinion).

3. Petitioner emphasizes (*e.g.*, Br. 44, 47, 49) that its claims do not cover the general idea of third-party intermediation of settlement risk, but instead recite a specific form of third-party intermediation. This Court has not suggested, however, that the abstract-ideas exception applies only to claims drawn at a high level of generality. To the contrary, mathematical equations like those at issue in *Benson*, *Flook*, and *Bilski* are highly specific, describing a precise relationship between particular inputs and outputs. And the Court in *Mayo* rejected the contention that the

"law of nature" exception to patent-eligibility depends on the specificity of the relevant natural law. 132 S. Ct. at 1302, 1303.[4]

Even when a claimed non-technological method of performing financial transactions or overseeing economic relationships is highly specific, moreover, its function still is to manipulate abstract concepts. As used in this context, therefore, the term "abstract" is best understood to mean, not the opposite of "specific," but the opposite of "concrete." That understanding of the abstract-ideas exception also reflects the fact that "methods of doing business fall outside of the subject matter that has 'historically been eligible to receive the protection of our patent laws.'" *Bilski*, 130 S. Ct. at 3239 (Stevens, J., concurring in the judgment) (quoting *Diehr*, 450 U.S. at 184); see pp. 15-16, *supra*.

Viewing the problem of patents that are outside the realm of technology, science, and industry as primarily one of adequate specificity also does not provide an administrable framework that can consistently be applied by thousands of PTO examiners. While it is easy to identify with precision the abstract idea contained in a process that employs a mathematical equation, it would be difficult to identify the underlying idea in claims like petitioner's at a consistent and predictable level of generality.

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[4] Patent law has many doctrines, including the written-description, enablement, and definiteness requirements of 35 U.S.C. 112, that effectively constrain claim breadth. Although a claim that fails one of those doctrines may also be invalid as an abstract idea, see *O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62, 119-120 (1854), the Court has never suggested that the abstract-ideas exception is the primary means of ensuring that claims are adequately specific.

II. PETITIONER'S METHOD CLAIMS ARE DRAWN TO AN ABSTRACT IDEA

When a claimed invention is alleged to fall within the abstract-ideas exception to Section 101, the critical question is whether the claim's elements "ensure that the patent in practice amounts to significantly more than" a claim for an abstract idea. *Mayo*, 132 S. Ct. at 1294. In the context of inventions that utilize a computer to facilitate business transactions and other human activities, the question is whether the computer imposes a meaningful limitation on the claim, such that the claim may be said to be directed to an innovation in computing or other technical fields instead of to a generalized use of computing power to implement an abstract method of organizing concepts and relationships. If the computer's role is more analogous to a field-of-use restriction or insignificant extra-solution activity—in other words, if it simply facilitates a financial transaction or other human activity that has not traditionally been viewed as eligible for patenting —then the recitation of a computer should not render the claim patent-eligible.

In undertaking that analysis, the first question should be whether the challenged method claims would be patent-eligible even without their recitation of a computer. If the answer to that question is "yes," it will be unnecessary to inquire into the nature of the computer limitations, as an otherwise patent-eligible claim will not cease to be patent-eligible simply because it is implemented on a computer. By contrast, when a claim, considered apart from its use of a computer, appears to be drawn to an abstract idea, the analysis should focus on whether its recitation of a computer serves to make the claim as a whole patent-eligible.

Here, petitioner's method claims, considered apart from any computer implementation, are directed to an abstract idea, *i.e.*, the manipulation of abstract financial concepts and relationships. The claims' incorporation of a general-purpose computer to perform routine computing functions does not render the claims patent-eligible.[5]

A. Considered Apart From Any Computer Implementation, Petitioner's Method Claims Would Be Directed To An Abstract Idea And Therefore Patent-Ineligible

1. Claim 33 of the '479 patent, which is representative of petitioner's method claims, recites a method of using a "supervisory institution" as an intermediary to mitigate settlement risk between two parties. Pet. App. 27a. During each day, the supervisory institution maintains and updates "shadow" records to reflect the value of each party's actual accounts held at "exchange institutions," permitting only those transactions for which the parties have sufficient resources. *Ibid.* At the end of the day, the intermediary irrevocably instructs the exchange institutions to carry out the permitted transactions. *Ibid.*; see J.A. 383-384.

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[5] In the court of appeals, the government did not take a position on the patent-eligibility of petitioner's claims, and instead urged the court to remand to permit the district court to resolve any claim-construction issues and factual disputes. Gov't C.A. Br. 24-25. Upon consideration of the opinions below and the parties' further briefing, it does not appear that any such disputes exist. The record therefore is sufficient for this Court to determine the patent-eligibility of petitioner's claims without further district-court proceedings.

That this claim is addressed to the manipulation of abstract legal and economic concepts is evident on its face: the claim recites a method of ordering two counterparties' financial affairs so as to mitigate the risk that one party will not perform at settlement. J.A. 383. As the specification explains, "the invention is concerned with the management of risk relating to specified, yet unknown, future events." J.A. 530. Petitioner's method, like the risk-management technique at issue in *Bilski*, is an "economic practice" that does not fall within patent law's traditional scope. 130 S. Ct. at 3231 (citation omitted); see, *e.g.*, 2 Henry Crosby Emery, *Speculation on the Stock and Produce Exchanges of the United States* 54-74 (1896) (discussing concept of using an intermediary to reduce settlement risk).

Petitioner contends that the claimed method is not abstract because the claims nowhere "recite a mathematical formula" or "any other form of fundamental truth that 'exists in principle apart from any human action.'" Pet. Br. 44 (quoting *Mayo*, 132 S. Ct. at 1297). As discussed above, however, the abstract-ideas exception is not limited to mathematical formulas, but instead encompasses methods of manipulating abstract concepts, such as the financial relationships and risks addressed in petitioner's patent. See pp. 20-22, *supra*.

Petitioner also argues (Br. 30, 44, 47, 49) that, by requiring start-of-day and end-of-day steps, and by directing the performance of certain actions simultaneously and in real time, its method claims avoid preempting all applications of the idea of using an intermediary to alleviate settlement risk. See Pet. App. 159a-160a. The relative specificity of petitioner's claims may render them less broadly preemptive, and thus less practically objectionable, than a claim that encompassed all uses of third parties to mitigate settlement risk.

The Court has not suggested, however, that the abstract-ideas exception applies only to highly general claims. See pp. 23-24, *supra*. Indeed, the Court in *Bilski* applied the abstract-ideas exception not only to Claim 1 of the challenged patent, which would have preempted the basic concept of hedging against risk in energy markets, but also to Claim 4, which recited a specific mathematical formula. See 130 S. Ct. at 3223-3224, 3231. Even if one views petitioner's method claims as relatively detailed, and therefore narrow in their preemptive scope, the claims are still directed to the abstract intellectual concept of ordering financial transactions so as to mitigate settlement risk. Like Bilski's hedging method, they do not disclose any innovation in the technological, scientific, or industrial areas that fall within patent law's traditional scope.[6]

B. The Method Claims' Incorporation Of A Computer Does Not Render Them Patent-Eligible

1. Because the risk-mitigation process described in petitioner's method claims is not otherwise patent-eligible, the Court must consider whether the claims' recitation of a general-purpose computer yields a different conclusion. The ultimate inquiry is whether the claims are directed to an innovation in computing or

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[6] In addition, although petitioner's claims describe a relatively specific series of steps to be performed by the intermediary, the claims are not limited to any particular sphere of commerce, but instead may sweep in broad swaths of economic activity. See J.A. 294-295; Pet. App. 30a-31a.

other technical fields instead of to an abstract method of organizing economic concepts and relationships.[7]

This Court's decisions in *Bilski* and *Mayo* establish that "the prohibition against patenting abstract ideas cannot be circumvented" by incorporating a computer in an ancillary or conventional role. *Bilski*, 130 S. Ct. at 3230 (citation and internal quotation marks omitted). In other words, the claim may not refer to a computer merely as a way of limiting the claim to a "particular technological environment," *ibid.* (citation omitted), or as a way of accomplishing insignificant extra-solution activity, *id.* at 3231. It is also insufficient to employ a computer in a conventional way if that use of the computer would be a practical prerequisite to any application of the abstract idea. Cf. *Mayo*, 132 S. Ct. at 1297-1298. Thus, the fact that a patent claim recites (or directly claims) a general-purpose computer or computer-readable medium, without more, does not render the claim a patent-eligible technological innovation. But cf. Pet. Br. 35. If it did, the mere recitation of the generic use of a computer would be sufficient to draw within the ambit of Section 101 claims to a wide range of non-technological human activities that have not traditionally been thought eligible for patenting.

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[7] When a court assesses the validity of a granted patent, the presumption of validity requires the challenger to demonstrate invalidity by clear and convincing evidence. See 35 U.S.C. 282; *Microsoft Corp.* v. *i4i Ltd. P'Ship*, 131 S. Ct. 2238, 2242 (2011). Contrary to respondents' argument (Br. 24 n.5), the presumption of validity applies to all invalidity defenses raised in litigation. See *Microsoft*, 131 S. Ct. at 2250 (the Court's cases "do not indicate, even in dicta, that anything less than a clear-and-convincing standard would ever apply to an invalidity defense raised in an infringement action"); *Mayo*, 132 S. Ct. at 1296 (judicial exception for laws of nature is an invalidity defense in litigation). Here, the presumption has been overcome, as *Bilski* and *Mayo* clarified the appropriate inquiry after the patents were granted, and the claims' use of a computer adds nothing of significance to the claims.

In the government's view, the following non-exhaustive list of factors, which are drawn from the relevant case law and PTO guidance,[8] should guide consideration of the computer's role within the claim:

- whether the computer constitutes insignificant extra-solution activity because it is only nominally related to the performance of the invention (*e.g.*, recording the results of a process), cf. *Bilski*, 130 S. Ct. at 3230;
- whether the computer is generically recited for its generic function, or whether specific, unconventional computer equipment or processing capabilities are required;
- whether the claim recites a computerized device that manipulates particular data in specific and useful ways, or whether the computer is recited solely for its generic functions, including automating and synchronizing tasks;
- whether the invention involves an improvement in the functioning of the computer as a computer, *e.g.*, by making it more efficient;

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[8] See also, *e.g.*, *Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of* Bilski v. Kappos, 75 Fed. Reg. 43,922, 43,925-43,926 (July 27, 2010); PTO, *2012 Interim Procedure for Subject Matter Eligibility Analysis of Process Claims Involving Laws of Nature* 3-5 (July 3, 2012), http://www.uspto.gov/patents/law/exam/2012_interim_guidance.pdf.

- whether the abstract idea is bound up in an invention that effects a transformation of matter, or whether the idea is merely described in a particular environment, cf. *ibid.*; and
- whether the computer-related elements of the claim represent conventional steps that would have to be employed by any person who wished to apply the abstract idea, cf. *Mayo*, 132 S. Ct. at 1297-1298.

This analysis is intended to distinguish attempts to patent ineligible subject matter—methods of organizing abstract concepts and relationships that use a computer in routine or insignificant ways—from inventions in which the computer imposes a meaningful limitation on the claim, such that the claim is directed to an innovation in computer technology or other field within patent law's traditional scope. Accordingly, the factors will tend to exclude business methods that do no more than recite a general-purpose computer in order to facilitate transactions or other endeavors. At the same time, the factors support the eligibility of technological, scientific, and industrial inventions, including software-based inventions that improve the performance of the computer system itself, such as digital imaging techniques and GPS technology. See, *e.g.*, *Research Corp. Techs., Inc.* v. *Microsoft Corp.*, 627 F.3d 859, 868-869 (Fed. Cir. 2010); *SiRF Tech., Inc.* v. *International Trade Comm'n*, 601 F.3d 1319, 1333 (Fed. Cir. 2010).

Advancements in computing techniques, such as computers programmed to perform specialized functions, see *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc), would also be patent-eligible. That includes technological inventions whose primary or sole utility is in business fields. For instance, a claim that discloses software that enables a computer to manipulate data in an innovative way would be patent-eligible even if its primary utility is in making financial transactions more efficient. That is so even if the underlying concept of performing financial transactions more efficiently, considered apart from the new computing technology, would not be patent-eligible.

2. Under the foregoing analysis, petitioner's method claims are drawn to an abstract idea, and are therefore patent-ineligible, notwithstanding their recitation of a computer.

To the extent the claims expressly recite a computer or computer components, the computer is recited in a manner that is only nominally related to the performance of the method—namely, receiving, recording, and transmitting information—and its generic recitation would encompass any machine capable of performing those basic steps. By its terms, the invention is concerned with the management of risk, using "electrical computers and data processing systems" merely to facilitate the efficient performance of the claimed risk-mitigation method. J.A. 243. The claims do not recite a computerized device that manipulates data in particular ways—*e.g.*, by providing a means of data compression—but rather recite the computer solely for its generic functions, including automating and synchronizing conventional tasks and facilitating routine communication.

The invention therefore does not involve an improvement in the ability of the computer to function as a computer. And the abstract idea of mitigating risk in settlement is not bound up in an invention that effects a transformation of matter, as in *Diehr*, 450

U.S. at 177. Finally, the computer-related elements of the claim represent conventional steps, described at a high level of generality, that would as a practical matter have to be employed by any person who wished to use petitioner's risk-mitigation method. Cf. *Mayo*, 132 S. Ct. at 1297-1298. The claims' incorporation of a computer therefore does not make the claims into something other than an abstract idea.

III. PETITIONER'S SYSTEM AND MEDIA CLAIMS RISE OR FALL WITH THE METHOD CLAIMS

Petitioner's claims to a computer system configured to perform its risk-management process, and to a computer-readable medium containing program code for performing the method, are also directed to an abstract idea. To be sure, the claimed computer system is a "machine," and the computer-readable medium is a "manufacture," within the meaning of Section 101. The system and media claims are not patent-eligible, however, because they amount in substance to attempts to patent the underlying abstract idea.

The operation of the abstract-ideas exception to Section 101 does not depend on the type of statutory subject matter claimed. The Court in *Mayo* did not dispute that the claimed method was a "process" within the meaning of Section 101. See p. 23, *supra*. The Court explained, however, that "[i]f a law of nature is not patentable, then neither is a process reciting a law of nature, unless that process has additional features that provide practical assurance that the process is more than a drafting effort designed to monopolize the law of nature itself." 132 S. Ct. at 1297; see *id.* at 1294 (patent eligibility should not "depend simply on the draftsman's art" (quoting *Flook*, 437 U.S. at 593)). Petitioner identifies no sound reason to distinguish, for this purpose, between "process" claims on the one hand, and "machine" or "manufacture" claims on the other.

Because "machine" and "manufacture" claims will tend to feature more concrete recitations of physical structure, they may be less likely as a class to trigger the abstract-ideas exception. But the same analytic approach should govern the application of the abstract-ideas exception to each category of patentable subject matter. That is particularly important in the context of claims for computer-implemented inventions, which—as this case illustrates—often can easily be framed as claims either for processes or for machines.

In this case, petitioner's system and media claims do not add anything of substance to the inventions claimed as methods.[9] The claims "set forth the same steps for performing third-party intermediation and provide for computer implementation at an incrementally reduced, though still striking level of generality." Pet. App. 37a; see *id.* at 33a. "Instead of wholly implied computer limitations, the[se] * * * claims recite a handful of computer components in generic, functional terms that would encompass any device capable of performing the same ubiquitous calculation, storage, and connectivity functions required by the method claims." *Id.* at 37a. The system and media claims thus do not disclose innovations in computing technology; instead, the computer elements merely facilitate in a generic way the efficient performance of the risk-mitigation method. Like the method claim, the system and media claims therefore are aimed at better enabling "the exchange of an obligation between parties," J.A. 1260; Pet. App. 32a—*i.e.*, a method of organizing human economic activity that is a patent-ineligible abstract idea.

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[9] Indeed, in its briefing before the en banc court of appeals, petitioner conceded that its media claims "rise or fall with the method claims." Pet. App. 81a.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

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FEBRUARY 2014

STATUTORY APPENDIX

1. Section 18 of the Leahy-Smith America Invents Act, Public Law No. 112-29, 125 Stat. 329 provides:

TRANSITIONAL PROGRAM FOR COVERED BUSINESS METHOD PATENTS.

(a) TRANSITIONAL PROGRAM.—

(1) ESTABLISHMENT.—Not later than the date that is 1 year after the date of the enactment of this Act, the Director shall issue regulations establishing and implementing a transitional post-grant review proceeding for review of the validity of covered business method patents. The transitional proceeding implemented pursuant to this subsection shall be regarded as, and shall employ the standards and procedures of, a postgrant review under chapter 32 of title 35, United States Code, subject to the following:

(A) Section 321(c) of title 35, United States Code, and subsections (b), (e)(2), and (f) of section 325 of such title shall not apply to a transitional proceeding.

(B) A person may not file a petition for a transitional proceeding with respect to a covered business method patent unless the person or the person's real party in interest or privy has been sued for infringement of the patent or has been charged with infringement under that patent.

(C) A petitioner in a transitional proceeding who challenges the validity of 1 or more claims in a covered business method patent on a ground raised under section 102 or 103 of title 35, United States Code, as in effect on the day before the effective date set forth in section 3(n)(1), may support such ground only on the basis of—

(i) prior art that is described by section 102(a) of such title of such title (as in effect on the day before such effective date); or

(ii) prior art that—

(I) discloses the invention more than 1 year before the date of the application for patent in the United States; and

(II) would be described by section 102(a) of such title (as in effect on the day before the effective date set forth in section 3(n)(1)) if the disclosure had been made by another before the invention thereof by the applicant for patent.

(D) The petitioner in a transitional proceeding that results in a final written decision under section 328(a) of title 35, United States Code, with respect to a claim in a covered business method patent, or the petitioner's real party in interest, may not assert, either in a civil action arising in whole or in part under section 1338 of title 28, United States Code, or in a proceeding before the International Trade Commission under section 337 of the Tariff Act of 1930 (19 U.S.C. 1337), that the claim is invalid on any ground that the petitioner raised during that transitional proceeding.

(E) The Director may institute a transitional proceeding only for a patent that is a covered business method patent.

(2) EFFECTIVE DATE.—The regulations issued under paragraph (1) shall take effect upon the expiration of the 1-year period beginning on the date of the enactment of this Act and shall apply to any covered business method patent issued before, on, or after that effective date, except that the regulations shall not apply to a patent described in section 6(f)(2)(A) of this Act during the period in which a petition for postgrant review of that patent would satisfy the requirements of section 321(c) of title 35, United States Code.

(3) SUNSET.—

(A) IN GENERAL.—This subsection, and the regulations issued under this subsection, are repealed effective upon the expiration of the 8-year period beginning on the date that the regulations issued under to paragraph (1) take effect.

(B) APPLICABILITY.—Notwithstanding subparagraph (A), this subsection and the regulations issued under this subsection shall continue to apply, after the date of the repeal under subparagraph (A), to any petition for a transitional proceeding that is filed before the date of such repeal.

(b) REQUEST FOR STAY.—

(1) IN GENERAL.—If a party seeks a stay of a civil action alleging infringement of a patent under section 281 of title 35, United States Code, relating to

a transitional proceeding for that patent, the court shall decide whether to enter a stay based on—

(A) whether a stay, or the denial thereof, will simplify the issues in question and streamline the trial;

(B) whether discovery is complete and whether a trial date has been set;

(C) whether a stay, or the denial thereof, would unduly prejudice the nonmoving party or present a clear tactical advantage for the moving party; and

(D) whether a stay, or the denial thereof, will reduce the burden of litigation on the parties and on the court.

(2) REVIEW.—A party may take an immediate interlocutory appeal from a district court's decision under paragraph (1). The United States Court of Appeals for the Federal Circuit shall review the district court's decision to ensure consistent application of established precedent, and such review may be de novo.

(c) ATM EXEMPTION FOR VENUE PURPOSES.—In an action for infringement under section 281 of title 35, United States Code, of a covered business method patent, an automated teller machine shall not be deemed to be a regular and established place of business for purposes of section 1400(b) of title 28, United States Code.

(d) DEFINITION.—

(1) IN GENERAL.—For purposes of this section, the term "covered business method patent" means a

patent that claims a method or corresponding apparatus for performing data processing or other operations used in the practice, administration, or management of a financial product or service, except that the term does not include patents for technological inventions.

(2) REGULATIONS.—To assist in implementing the transitional proceeding authorized by this subsection, the Director shall issue regulations for determining whether a patent is for a technological invention.

(e) RULE OF CONSTRUCTION.—Nothing in this section shall be construed as amending or interpreting categories of patent-eligible subject matter set forth under section 101 of title 35, United States Code.

AMICUS
CURIAE
BRIEF

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IN THE

SUPREME COURT OF THE UNITED STATES

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES, LTD.,

Respondents.

On Writ of Certiorari
to the United States Court of Appeals
for the Federal Circuit

BRIEF FOR *AMICUS CURIAE* ADVANCED BIOLOGICAL LABORATORIES, SA IN SUPPORT OF PETITIONER

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QUESTION PRESENTED

Whether claims to computer-implemented inventions — including claims to systems and machines, processes, and items of manufacture — are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court.

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INTEREST OF *AMICUS CURIAE*[1]

Advanced Biological Laboratories, SA ("ABL") develops advanced software technologies for the personalized management and treatment of diseases such as HIV/AIDS, hepatitis, tuberculosis, and cancer. ABL's TherapyEdge is a computerized expert system for assisting physicians in the treatment of these and similar diseases. TherapyEdge has been demonstrated to improve patient treatment and outcomes.

ABL owns U.S. Patent Nos. 6,081,786 and 6,188,988, which claim a computerized expert system for selecting treatment for patients with identified diseases. These two patents were recently invalidated by the Federal Circuit under § 101 as claiming merely the mental steps performed by a doctor, even though the claims specifically recited computer implementations. See *Smartgene, Inc. v. Advanced Biological Labs.*, No. 13-1186 (Fed. Cir. Jan. 24, 2013).

As *amicus curiae*, ABL proposes an objective approach for the determination of patent eligibility.

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[1] In compliance with Rule 37, counsel for both parties have deposited with the Clerk of this Court general consent to the filing of *amicus* briefs. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amicus curiae*, its members, or its counsel made a monetary contribution to its preparation or submission.

SUMMARY OF ARGUMENT

This Court has long made clear that certain types of inventions—including abstract intellectual ideas—are not eligible for patent protection under 35 U.S.C. § 101. While it may be relatively easy to identify a law of nature or a mathematical axiom, the ability to identify a claim directed only to a proscribed abstract intellectual concept, however, has challenged both courts and litigants. The Court now has an opportunity to articulate an objective framework for evaluating patent eligibility generally, and more particularly, for determining whether a claim preempts an abstract intellectual idea.

The Court has identified preemption as a core approach to patent eligibility. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S.Ct. 1289, 1301 (2012) ("In *Bilski* the Court pointed out that to allow 'petitioners to patent risk hedging would preempt use of this approach in all fields.'") (quoting *Bilski v. Kappos,* 130 S.Ct. 3218, 3231 (2010). However, the courts have struggled with the mechanics of *how* to implement this test, with the result being that the analysis has become primarily subjective. *CLS Bank Int'l v. Alice Corp. Pty.*, 717 F.3d 1269, 1278 (Fed. Cir. 2013) (en banc) (Lourie, J., concurring) ("[D]eciding whether or not a particular claim is abstract can feel subjective and unsystematic, and the debate often trends toward the metaphysical, littered with unhelpful analogies and generalizations.").

Objective preemption provides a solution to the subjectivity that has characterized preemption thus far and is consistent with this Court's jurisprudence. Objective preemption is based on whether a person of ordinary skill in the art (POSITA) would consider the actual claim limitations to wholly preempt all practical applications of the abstract intellectual idea, law of nature, or natural phenomenon in the real world.

The POSITA's viewpoint is used throughout patent law to provide an objective, technology-neutral basis for evaluating questions of law and fact, including claim construction and obviousness based on underlying factual predicates. Under objective preemption, patent eligibility remains a question of law to be decided by the courts, but which is predicated on facts.

Objective preemption is a methodology that can be readily applied by courts and by the USPTO. Both the courts and the USPTO are familiar with a POSITA analysis in determining the scope of claims and whether claims cover a particular technology. Courts need not delve into policy questions or philosophical speculation when applying objective preemption.

Objective preemption first requires determining whether the claim implicates a law of nature, a scientific truth, a purely mathematical concept, or a purely abstract intellectual idea. Identifying laws of nature (e.g., $E=mc^2$, Newton's laws of gravity, the laws of electromagnetism), scientific truths (e.g., water boils at 100° C), and purely mathematical theorems and axioms (e.g., $a+b = b+a$) divorced from specific technical applications is relatively straightforward. The Court in *Benson, Flook*, and *Diehr* deemed the claims in those cases to be in the last category.

More complex is the "abstract idea" exception. This exception to § 101 is for purely *intellectual* ideas that do not have physical or tangible aspects. "Phenomena of nature, though just discovered, mental processes, and abstract *intellectual* concepts are not patentable." *Benson*, 409 U.S. at 67 (emphasis added). Over time the adjective "intellectual" has been dropped from the expression, and this modification has led to much of the confusion in the case law. The Court should clarify that the exception is properly understood in its original sense.

The POSITA recognizes that an abstraction, *i.e.*, a generalization, does not make a claim to an abstract intellectual idea, since all claims must use generalizations to define an invention that is not limited to the specific embodiments: "[T]he Patent Act requires that the claims themselves set forth the limits of the patent grant, but also because persons of ordinary skill in the art rarely would confine their definitions of terms to the exact representations depicted in the embodiments." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc). Similarly, the use of mathematical formulae does not make a claim an abstract intellectual idea because mathematical equations are commonly used in technology to precisely describe physical or empirical relationships. Hundreds of thousands of patents recite mathematical expressions for specific practical applications. This is the difference between applied mathematics (generally patent eligible) and pure mathematics (generally ineligible).

Under objective preemption, a court would first have to identify the claim as directed to a law of nature, scientific fact, or purely abstract intellectual idea divorced from tangible mechanisms, necessarily and inherently mental in nature. The patent specification and file history are objective sources for determining whether there is a law of nature, scientific fact, or abstract intellectual idea in a claim, as well as for identifying significant claim limitations. If a claim does not clearly and unambiguously set forth one of these prohibited categories, then the claim recites a statutory process, apparatus, or article of manufacture and is patent eligible. Only if a claim expressly covers a law of nature, scientific fact, or abstract intellectual idea does the preemption analysis proceed to the next step.

Objective preemption requires that the objective scope of the claim be determined by identifying limitations that are significant to a POSITA. This is because it is the POSITA who would implement a practical application of the idea in the real world. The POSITA would recognize as meaningful limitations that a lay person would consider trivial or insignificant. A plain English gist of the claim is not consistent with the patent statute, which requires that novelty, non-obviousness, enablement, and infringement all be determined with respect to the invention *as claimed*.

Next, a court must determine whether a claim wholly preempts *all* practical applications of a law of nature, scientific fact, or abstract intellectual idea, from the perspective of POSITA. "Pre-emption is only a subject matter eligibility problem when a claim preempts all practical uses of an abstract idea." *CLS Bank Int'l v. Alice Corp. Pty.*, 717 F.3d 1269, 1300 (Fed. Cir. 2013) (en banc) (Rader, C.J., concurring-in-part and dissenting-in-part). The court should determine whether the POSITA would identify practical applications of the abstract idea that do not infringe the claim. The presumption of validity places the burden on the patent defendant to show by clear and convincing evidence that a POSITA would not find any non-infringing practical applications.

Objective preemption avoids the use of *ad hoc*, technology-specific rules to determine whether claim elements contribute to patent eligibility.

Alice's claims are patent eligible under an objective preemption analysis. A POSITA would identify, at the very least, the dual shadow accounts and the settlement ordering as meaningful limitations, since there are other practical applications of the abstract idea of credit intermediation by a third party that would not use these features.

ARGUMENT

I. OBJECTIVE PREEMPTION IS THE BEST FRAMEWORK FOR EVALUATING PATENT ELIGIBILITY

Whether a claim is patent eligible does not turn solely on whether the claim involves an abstract idea, law of nature, or scientific truth. This Court has instructed that it must be determined whether the claim would "preempt all uses" of such subject matter. *Diehr*, 450 U.S. at 203.

However, the precise issue is *how* to implement preemption as a workable doctrine that can be applied by courts and the patent community. The issue is not whether the claim preempts *some* application of the abstract intellectual idea, but whether the claim preempts all practical applications in the real world. *Diehr*, 450 U.S. at 202 ("[T]he court must then determine whether the claim would wholly preempt that algorithm."); see also *CLS*, 717 F.3d at 1281, 1283 (Lourie, J. concurring) ("What matters is whether a claim threatens to subsume the full scope of a fundamental concept, and when those concerns arise, we must look for meaningful limitations that prevent the claim as a whole from covering the concept's every practical application."; "The § 101 preemption analysis centers on the practical, real-world effects of the claim.").

The Federal Circuit has struggled to develop a clear and objective methodology. That court has been unable to distinguish between abstractions generally, and the proscribed abstract intellectual ideas that are entirely mental in nature. Second, *ad hoc* rules (exclusions of pre-solution and post-solution activity, fields of use, conventional steps), or admonitions (e.g., "so manifestly abstract as to override the statutory language," *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir. 2010)), have become simply automatic proxies for answering the preemption question itself. These proxies are utilized without any objective grounding, and end up being subjective: what one court considers mere post-solution activity, another court considers a significant and meaningful limitation.

To avoid the current subjectivity of § 101 analysis, the preemption analysis must have an objective basis. That objective basis is provided by POSITA. The perspective of POSITA is used to evaluate both the actual limitations of the claims and the facts as to whether the claims cover all practical applications of an abstract intellectual idea in the real world.

Objective preemption is the best framework for addressing § 101. First, it is adaptable. This characteristic is essential because "[t]echnology and other innovations progress in unexpected ways," *Bilski*, 130 S.Ct. at 3227, and unlike fixed talismanic rules that do not adapt over time, the perspective of a POSITA can change to incorporate such advances. The approach is also technology-independent—it does not discriminate for or against specific technologies—because POSITA can be focused on the relevant technology for a case at hand. These two features are necessary for any framework because otherwise there is a serious risk that § 101 will weed out, rather than "encompass new and unforeseen inventions." *J. E. M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135 (2001).

Unlike some policy-based approaches,[2] objective preemption is a methodology that is truly "operational" by a court. Trial courts are adapted to judge facts, not to make philosophical decisions or long-range speculations. They are already familiar with the concept of POSITA and accustomed to the use of experts to determine its content. They have long institutional experience in deciding whether a claim is infringed—precisely the skill needed to decide whether a claim does or does not cover all practical applications of an idea in the real world.

II. POSITA IS COMMONLY USED IN PATENT LAW AS AN OBJECTIVE BASIS FOR DETERMINING PATENTABILITY AND INFRINGEMENT

The perspective of POSITA is commonly used as an objective basis for evaluating requirements of the patent law, including questions of law. The POSITA's view is fundamental to the determination of claim construction, *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc); indefiniteness, *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1383 (Fed. Cir. 2005); enablement and written description, *Novozymes A/S v. DuPont Nutrition Biosciences APS*, 723 F.3d 1336, 1344 (Fed. Cir. 2013); obviousness, *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007); and infringement under the Doctrine of Equivalents, *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950). See also Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 Berkeley Tech. L.J. 1155, 1186-87 (2002) (noting POSITA's use in definiteness, enablement, best mode, claim construction, and doctrine of equivalents).

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[2] See, e.g., Lemley, Risch, Sichelman, & Wagner, *Life After Bilski*, 63 Stan. L. Rev. 1315, 1341 (2011), which requires the court to consider such speculations as: "Is the claimed invention potentially generative of many kinds of new inventions; Does the industry rely heavily on cumulative invention? Is the technological field fast-moving? . . . Has the patentee made an important contribution relative to the prior art?" A court would be unable to establish these factors with any degree of certainty.

In particular, obviousness is a question of law that is based on the factual predicate of the four factors set forth in *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 14 (1966): (1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) secondary considerations. Courts rely on a POSITA to answer these factual predicates and avoid unsubstantiated reliance on an allegedly "common sense view" of what is obvious. *Mintz v. Dietz & Watson, Inc.*, 679 F. 3d 1372, 1377 (Fed. Cir. 2012). Claim construction is a question of law, but is based on the facts of the record, and can take into consideration expert testimony as to the meaning of claims.

Similarly, patent eligibility is a question of law, which a court should answer based on the following factual predicates:

(1) the level of ordinary skill in the art;

(2) the abstract intellectual idea, if any, implicated by the claim;

(3) the scope of the claim, including any meaningful limitations; and

(4) whether the scope of the claim covers, or preempts, *every* practical application of the abstract intellectual idea.

These predicates are factual, given the very nature of the preemption: they ask what is practical, what is the effect of the claim in the real world, and whether claim limitations are meaningful or not to a POSITA.

To identify the characteristics of a POSITA, the court should consider the PTO's classification of the invention. See, e.g., *Zobmondo Entertainment, LLC v. Falls Media, LLC*, 602 F.3d 1108, 1121 (9th Cir. 2010) ("Deference to the PTO's [trademark] classification decision is sensible because the PTO has special expertise that we lack on this fact-intensive issue") (internal quotations omitted). *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 447 (Fed. Cir. 1986). The classification informs the court as to the "relevant audience" for the patent claims, *Mayo*, 132 S.Ct. at 1297-98, 1300-01, and thus the appropriate technological orientation of the POSITA. This gives the court an objective basis for interpreting the claim, rather than its own subjective belief as to the relevant audience.

In *Benson, Flook, Diehr*, and *Bilski*, the Court addressed the patent eligibility of a claim in a pending patent application, and hence there was no presumption of validity attached. Those cases could be decided on the record before the Court, and based on a preponderance of the evidence standard. However, given the presumption of validity, an *issued* claim cannot be found patent ineligible unless there is clear and convincing evidence (*e.g.*, expert testimony, prior publications) demonstrating that the real-world effect of the claim is to cover every practical application of the alleged abstract intellectual idea. A court by itself cannot evaluate whether a claim covers every practical application: it has neither the specialized knowledge nor the technical experience to know this. It must rely on facts presented by the parties, and it should use POSITA as the objective basis for making this determination.

III. APPLYING OBJECTIVE PREEMPTION TO PATENT CLAIMS

A. Claim Interpretation Based on the View of a POSITA Avoids the Subjectivity of a Plain English Gist of the Claim

For a patent claim to be eligible, it must have significant and meaningful limitations. *CLS*, 717 F.3d at 1281 (Lourie, J., concurring) ("[W]e must look for meaningful limitations that prevent the claim as a whole from covering the concept's every practical application"). The question must be asked: Significant and meaningful *to whom*?

This is the heart of the problem, because in the absence of an objective standard, each court is left to its own intuition and subjective viewpoint about what is or is not significant. Indeed, as this very case demonstrates, more than anything else, the Federal Circuit is divided in deciding which claim limitations matter and which do not. See, e.g., *CLS*, 717 F.3d at 1330 (Linn., J., dissenting) (stating that the concurrence by Judge Lourie "ignores the substance of the stipulations and assumptions upon which the proceedings below were predicated"); *id.* at 1308 (Rader, C.J., concurring in part, dissenting in part) ("It would be improper for the court to ignore these limitations [of the system claims]").

"What matters is the objective reach of the claim." *KSR*, 550 U.S. at 419. There is no statutory or doctrinal basis for applying a different level of objectivity to claim analysis when considering § 101. While a formal claim construction is not absolutely necessary, a court should interpret the scope of the claim in view of the underlying science and technology. Therefore, an *objective* approach to preemption requires that the claim be interpreted as it would be by a POSITA. This follows from the very nature of the preemption test itself.

First, claim interpretation by a POSITA is necessary because preemption focuses on practical applications in the real world, and it is precisely a POSITA who would create such practical applications. Similarly, whether a claim limitation is meaningful must be determined through the eyes of a POSITA precisely because that is a fictitious person who would understand which claim limitations have significance and which do not. In other words, for purposes of objective preemption, a claim limitation is meaningful or significant if a POSITA would understand it as being a necessary feature of the invention *as claimed*, because such a limitation defines how the invention is practiced in the real world. In this context, a POSITA would recognize as meaningful and significant those limitations that may incorrectly appear to be trivial to a layperson unfamiliar with the technology's subtleties, the practices of the relevant technological community, and the significance of seemingly minor details. See *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051 (Fed. Cir. 1988) ("That which may be made clear and thus 'obvious' to a court, with the invention fully diagrammed and aided by experts in the field, may have been a breakthrough of substantial dimension when first unveiled") (internal citation and punctuation omitted). Likewise, POSITA would also filter out claim limitations that were mere clever drafting or window dressing.

The use of POSITA ensures that the claim interpretation is consistent with the science and technology underlying a claim. Such an understanding is especially important because in most cases the underlying science or technology is not expressly recited: claims are meant to capture the invention, not explain the underlying science in the field.

Thus, a court should not determine that a limitation is "insignificant" by simply applying *ad hoc* rules against "pre- or post-solution activity," or "conventional and routine" based on its own intuition or experience, for otherwise it ends up "hunting for abstractions by ignoring the concrete, palpable, tangible limitations of the invention the patentee actually claims." *CLS*, 717 F.3d at 1298 (Rader, C.J., concurring-in-part and dissenting-in-part). Thus, the determination of whether a claim limitation is meaningful is necessarily a question of fact, because it "centers on *practical, real-world* effects of the claim." *Id.* at 1283 (Lourie, J., concurring) (emphasis added).

Objective preemption avoids the subjectivity that is inherent in the plain English approach to § 101. When a court reduces the claim to a simplified description in the absence of the perspective of POSITA, it almost unavoidably imposes its own view of which limitations are significant and which limitations are not, and the subjective and unspoken assumptions take over from the start: If a court subjectively believes that a particular limitation is not meaningful, it can simply ignore it entirely or characterize it so generally as to remove any significant functional or structural importance it may play in the overall solution. Further, simplifying a claim in the absence of a consideration of the file history risks ignoring limitations that were specifically used to distinguish the claim over the prior art—which makes such claim limitations meaningful to POSITA because they constrain how the invention may be practiced in the real world. Relying on a plain English reduction of a claim essentially begs the question, since it filters out limitations that the court has implicitly determined to be insignificant, before any evidence has even been considered.

The risk of subjectivity in a plain English gist of a claim is at its greatest for those inventions that make technology simpler and easier to use—indeed precisely the inventions that aid humans in the use of ever more complex and pervasive technologies. Computers and complex systems surround us in every capacity, and yet we must necessarily interact with and control them. Inventions that make products such as software easy to use are especially at risk from a plain English gloss precisely because after the fact they seem simple and easy to understand. An invention that achieves the difficult goal of simplifying complexity can all too easily be trapped by the naïve conclusion that there is no inventive concept and that the invention is nothing more than a simply stated "abstract idea."

B. Objective Preemption Is Consistent with the Patent Statute

Section 101 by its terms implicates § 112(b), stating that a patent on "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof," are "subject to the conditions and requirements of this title," which necessarily includes § 112. Section 112(b) requires claims to what the inventor regards as the invention, for which the specification must provide "a written description of the invention" and must "enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." The *invention* referenced in § 112 is the invention as claimed, not a simplification thereof. *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 956 (Fed. Cir. 1983) ("it is for the invention as claimed that enablement must exist"); see also *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1333 (Fed. Cir. 2003) (in the context of written description support, "under our precedent the patentee need only describe the invention as claimed, and need not describe an unclaimed method of making the claimed product"). Validity under §§ 102 and 103, and infringement under § 274, are all resolved with respect to the claims. Accordingly, where the statute uses the term *invention*, it is understood throughout that this means the *invention as claimed*, not a plain English reduction. See *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 345 (1961) ("[T]here is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention."). There is no legislative history to suggest that § 101 would be based on something other than the claims themselves.

It would be anomalous for Congress to have written the patent statute to require that patents have claims; that the PTO evaluate the claims for compliance with §§ 101, 102, 103, and 112; and that courts determine infringement, prior art validity, enablement and written description with respect to the claims; but then intended § 101 to be decided in litigation based on a subjective, plain English gloss.

C. Objective Sources for Identifying the Abstract Idea

The objective preemption analysis requires the unambiguous identification of the abstract idea in a patent claim. "In short, one cannot meaningfully evaluate whether a claim preempts an abstract idea until the idea supposedly at risk of preemption has been unambiguously identified." *CLS*, 717 F.3d at 1282 (Lourie, J., concurring). Objective preemption uses the patent and file history as the best objective sources of the abstract idea.

In identifying whether a claim implicates an abstract idea at all, the court must distinguish between the acceptable use of abstractions, and the recitation of "abstract intellectual concepts" *per se*. The exclusion from § 101 is of abstract *intellectual* ideas: "Phenomena of nature, though just discovered, mental processes, and abstract *intellectual* concepts are not patentable, as they are the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67 (emphasis added). "[T]he Court clearly held that new mathematical procedures that can be conducted in old computers, like mental processes and abstract *intellectual* concepts, are not patentable processes within the meaning of §101." *Diehr*, 450 U.S. at 201 (internal citation omitted, emphasis added). The focus on abstract intellectual ideas originates with this Court's concern with "ideas" that are purely mental in nature, such as "mental processes" or "mental steps" that could be performed in the human mind. *Diehr*, 450 U.S. at 195 ("Under the 'mental steps' doctrine, processes involving mental operations were considered unpatentable. The mental steps doctrine was based upon the familiar principle that a scientific concept or mere idea cannot be the subject of a valid patent.") (internal citations omitted). Indeed, the traditional definition of "idea" refers *specifically* to the mental phenomenon: "any conception existing *in the mind* as a result of mental understanding, awareness, or activity. "Idea," Dictionary.com, http://dictionary.reference.com/browse/idea; see also "Idea," Webster's Third New International Dictionary (2002) ("an object *of the mind* existing in apprehension, conception, or thought; a product of reflection or mental conception").

Thus, there is a difference between an abstraction and an abstract intellectual idea. An abstraction is a generalization—a term or definition that identifies the principal aspects or features of the concept that are relevant to a given context, while removing features that are not important: "the act or process of leaving out of consideration one or more qualities of a complex object so as to attend others." "Abstraction," Webster's Third New International Dictionary (2002).

For example, the concept of a *container* is an *abstraction* over various types such as *cup*, *glass*, *tumbler*, *stein*, *pitcher*, *champagne flute*. The abstraction of a *container* could contribute to eligible subject matter, while the abstract intellectual idea of *government* or *contract* would not.

By design and practice, patent claims necessarily make use of abstractions. This has been long recognized:

> The difficulty which American courts . . . have had . . . goes back to the primitive thought that an "invention" upon which the patent gives protection is something tangible. The physical embodiment or disclosure, which, in itself is something tangible is confused with

> the definition or claim to the inventive novelty, and this definition or claim or monopoly, also sometimes called "invention" in one of that word's meanings is not something tangible, but is an abstraction. Definitions are always abstractions. This primitive confusion of "invention" in the sense of physical embodiment with "invention" in the sense of definition of the patentable amount of novelty, survives to the present day, not only in the courts, but among some of the examiners in the Patent Office.

Emerson Stringham, *Double Patenting* 209 (1933).

Further, not every abstract idea (or abstraction) is a fundamental truth. In *Benson, Diehr*, and *Flook*, the Court was presented with what it believed to be a scientific truth expressed in mathematical terms. The Court in Benson assumed that the claim embodied the pure mathematics of converting binary coded decimal to binary. In *Flook*, the claim included a broad equation for controlling a catalytic reaction. In *Diehr*, an application of the well-known Arrhenius equation was claimed. Thus, in each case, the Court had before it what it believed to be a "fundamental truth" about the real world, something that no one can be said to have "invented."

However, the abstract ideas and abstractions used in the vast majority of claims are not fundamental or "true" in any sense. Even the broad abstract idea of "presenting information on web pages" is not a *truth*, let alone a *fundamental* one, though it may be a very obvious one. An abstract idea or abstraction may be very common and well known, but that does not make it a "fundamental truth" of the type that this Court has indicated as being ineligible for patent.

Similarly, mathematical formulas and algorithms themselves are not *per se* scientific truths. Certainly, mathematics can be used to describe fundamental truths, such as $E=mc^2$, but that does not mean that all mathematical equations and formulas are necessarily scientific truths. Mathematics is a language that can be used to precisely express quantitative relationships. Most mathematical formulas, including those contained in patent claims, are applicable only to decidedly mundane things, such as calculating navigation directions for a shortest route to avoid traffic conditions, scheduling airplane landings and takeoffs, or determining the number of unique visitors to a website. Thus the presence of a mathematical algorithm in the claim does not by itself inform whether the claim recites a fundamental truth. See Br. for Ronald M. Benrey as *Amicus Curiae* at 22-25, *Alice Corp v. CLS Bank,* No. 13-298 ("Benrey").

The specification is the best guide to what abstract idea, if any, may be implicated in a claim, since the claims "must be read in view of the specification, of which they are a part." *Phillips,* 415 F.3d. at 1315 (citations omitted). If an inventor is in fact attempting to claim an abstract intellectual idea, the specification would clearly indicate this intent by describing unambiguously "intellectual" concepts, in terms divorced from physical or material things, or processes that inherently require human judgment. For example, the summary of the invention would articulate the invention in fully abstract and intellectual terms, not merely in broad generalizations of computer applications. The balance of the specification would likewise disclose a primarily conceptual description, with only perfunctory discussions of an actual implementation.

Significantly, software inventions are based on a development process that uses the process of abstraction to define relevant structures and operations. A computer program for a financial institution would have abstractions such as *accounts*, *transactions*, *deposits*, and *payments*. Grady Booch, one of the pioneers in object-oriented programming, describes the importance of abstraction in software development:

> The primary value of such abstractions is that they give boundaries to our problem; they highlight the things that are in the system and therefore relevant to our design, and suppress the things that are outside of the system and therefore superfluous.

Booch, *Object Oriented Analysis and Design*, 162 (1994).

Booch goes on to say that:

> [T]he identification of key abstractions involves two processes: discovery and *invention*. Through discovery, we come to recognize the abstractions used by domain experts; if the domain expert talks about it,

> then the abstraction is usually important. *Through invention we create new classes and objects that are not necessarily part of the problem domain, but are useful artifacts in the design or implementation.*

Id. (emphasis added). Thus, the development of computer applications often includes inventing the appropriate abstractions that are not inherent in the underlying problem.

Claims for software inventions are more at risk for being mistaken as "abstract ideas" by those who are not familiar with the underlying nature of software (as a set of mechanisms for controlling a machine) and the way it is created. Courts should take into account the actual software technology involved in an invention as disclosed and claimed, rather than merely a lay person's interpretation of the claims. A specification with a detailed software implementation, including flowcharts, algorithms, and code examples, is objective evidence that the invention as claimed is a technical invention, not merely an abstract idea *per se*. Kayton, *Patent Protectability of Software: Background and Current Law*, in The Law of Software 1968 Proceedings B-25 (1968) ("Disclosure of apparatus for performing the process without human intervention may make out a prima facie case that the disclosed process is not mental and is, therefore, statutory."). A POSITA can be invoked to determine whether the specification indicates that the inventor intended to patent an abstract idea, or particular applications of that idea.

The abstract idea and significant claim limitations may also be found in the file history. Patent examiners frequently provide a detailed statement of their reasons for allowing the claims, which may describe the particular abstract idea implicated by the claims, and how certain limitations of the claim differentiate over the art.

D. A Claim That Recites an Abstract Idea Is Statutory Where There Are Alternative, Practical, Non-Infringing Ways of Practicing the Abstract Idea

Once the scope of the claim and its meaningful limitations are determined, the final step of objective preemption is to determine whether the claim covers all and every practical application of the abstract idea in the real world, not merely some applications. This, too, is something that POSITA's perspective would assist with. Even a narrow claim covers *some* practical applications; that is a feature of every patent, not a problem. "It is not the breadth or narrowness of the abstract idea that is relevant, but whether the claim covers *every* practical application of that abstract idea." *CLS,* 717 F.3d at 1300 (Rader, C.J., concurring-in-part and dissenting-in-part) (emphasis added).

Because objective preemption considers whether *all* practical applications are encompassed by the claim, the approach can be stated as a question of whether there is at least one alternative, non-infringing, practical application of the abstract idea. "The [system] claims do not claim only an abstract concept without limitations that tie it to a practical application. Confirming this, someone can use an escrow arrangement in many other applications, without computer systems, and even with computers but in other ways without infringing the claims." *Id.* at 1309 (Rader, C.J., concurring-in-part and dissenting-in-part). "Moreover, because the claims require specific computer components, a human performing the claimed steps through a combination of physical or mental steps likewise does not infringe. In sum, this system does not preempt anything beyond the specific claims, let alone a broad and undefined concept." *Accenture Global Services v. Guidewire Software, Inc.* 728 F.3d 1336, 1348 (Fed. Cir. 2013) (Rader, C.J., dissenting).

It is noted that the Court in *Diehr* stated, "We rejected in *Flook* the argument that because all possible uses of the mathematical formula were not pre-empted, the claim should be eligible for patent protection." *Diehr*, 450 U.S. at 192 n.14. However, this statement is entirely at odds with the requirement that a claim "wholly preempt" "every" practical application, which is how the preemption doctrine is consistently stated *every time in every case*, from *Benson* to *Mayo*. Logically, if there is at least one non-infringing use, then the claim does not "wholly preempt" "every" application.

A court should consider the findings of the patent examiner regarding which limitations distinguish over the prior art as *prima facie* meaningful limits on the scope of the claim, and which must be implemented to practice the claimed invention. These findings are relevant not to show the invention is non-obvious, but rather to provide intrinsic evidence that certain features of the claims are significant. For example, what a court may deem to be simple "post-solution" activity may be a limitation that was necessary to distinguish over the prior art; POSITA would consider such a limitation meaningful, because it would indicate that there are alternative ways of practicing the abstract idea that did not have the limitation in question, and that the limitation is not conventional or routine. A patent defendant would have the burden to present clear and convincing evidence that rebuts these findings.

Accordingly, the patent defendant would have the burden of providing by clear and convincing evidence that there are no "practical" ways of implementing the "abstract idea" that do not include the significant claim limitations. If the patentee produced evidence of at least one practical, non-infringing alternative, such as prior art that performs the same abstract idea, then a patent claim must be held patent eligible. An expert could provide evidence that POSITA would consider a particular alternative as a "practical" application of an abstract idea, or an impractical attempt, either because the other available technologies would not work, the cost would be infeasible, or for other considerations (though merely being less efficient, more expensive, or less competitive would not disqualify an alternative from being "practical").

Viewing the objective preemption methodology as a question of whether there are alternative, practical, and non-infringing ways of practicing the abstract idea underlying a patent claim has the benefit of being exactly the type of procedure that a court can readily implement. Courts are already familiar with performing infringement and anticipation analyses by first considering the scope of a claim, and then determining whether a particular "application"—either a defendant's product or an item of prior art—comes within the scope of the claim, the former being an instance of infringement, the latter making the claim invalid by anticipation. Courts are already sensitive to the idea that every claim limitation must be met in the target instrumentality: if a limitation is not found in the defendant's product, then it does not infringe; if a limitation is not found in the prior art, then the claim is not anticipated.

Courts are well-positioned to perform a similar analysis for patent eligibility, but in the converse: if there does exist a prior art device, system, or method that practices the same abstract idea as in the patent claim, but that does not anticipate the claim, then it logically follows that the claim does not preempt all practical applications in the real world. And just as a court can consider expert testimony as to whether a claim limitation is found in the prior art or an accused device, a court can consider expert testimony as to whether a claim blocks all practical applications or whether there is some non-infringing practical alternative.

IV. THE PREEMPTION ANALYSIS SHOULD NOT RELY ON *AD HOC* RULES THAT ARE TECHNOLOGY SPECIFIC

An objective approach to § 101 does not rely on *ad hoc*, technology-specific rules to determine patent eligibility. Indeed, outside of computer-implemented inventions, no other technology field has *ad hoc* rules applied to determine patent eligibility.

A. *Flook's Ad Hoc* Rules Are Based on a Point of Novelty Approach to § 101

The rules against pre-solution, post-solution, and field of use limitations derive primarily from *Parker v. Flook*, 437 U.S. 584 (1978). That case evaluated § 101 only as it applies the "point of novelty" in the claim, which the Court called the "inventive concept." "Proper analysis, therefore, must start with an understanding of what the inventor claims to have discovered—or, phrased somewhat differently—what he considers his inventive concept to be." *Diehr*, 450 U.S. 204, 212 (Stevens, J., dissenting). The *Flook* Court used the "inventive concept" not as a *conclusion* about whether the invention is novel in fact, but rather as a *label* for identifying the subject matter of the § 101 inquiry. Given this, dissection of a claim was appropriate to identify the features that were believed by the inventor to be his inventive concept. That is, if § 101 analysis were applied only at the point of novelty, rather than to the claim as a whole, it would make sense that pre-solution activity, post-solution activity, or field of use limitations would not confer patent eligibility. If the "solution" step were deemed to be the point of novelty, then it would logically follow that claim limitations as to what happens before (pre-solution and data gathering) and afterwards (post-solution) could not contribute, nor could the restriction of the solution to a particular field.

Justice Stewart, joined by Chief Justice Burger and Justice Rehnquist, emphatically disagreed with this approach of applying § 101 only at the point of novelty, stating: "it strikes what seems to me an equally damaging blow at basic principles of patent law by importing into its inquiry under 35 U.S.C. § 101 the criteria of novelty and inventiveness." *Flook*, 437 U.S. at 600 (Stewart, J., dissenting).

B. *Diehr* Rejected *Flook's* Approach, but Retained *Flook's* *Ad Hoc* Rules

The dissent in *Flook* became part of the majority in *Diehr* and correctly rejected *Flook's* point of novelty approach. The *Diehr* Court held "the fact that one or more of the steps in respondents' process may not, in isolation, be novel or independently eligible for patent protection is irrelevant to the question of whether the claims as a whole recite subject matter eligible for patent protection under § 101." *Diehr*, 450 U.S. at 193. See also *In re Taner*, 681 F.2d 787, 791 (C.C.P.A. 1982) ("*Diehr* rejected the 'point of novelty' analysis saying 'the 'novelty' of any element or steps in a process...is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter") (citation omitted). Because § 101 applies to the claim as a whole, "it is inappropriate to dissect the claims into old and new elements," even if one of those elements is a law of nature or a scientific truth. *Diehr*, 450 U.S. at 188.

While *Diehr* rejected *Flook's* dissection approach, it kept the *ad hoc* rules set forth in *Flook* without applying them in fact to the claims before it. It is incontestable that the remaining steps of Diehr's claim were all conventional pre-solution and post-solution activity. *Diehr*, 450 U.S. at 207-209 (Stevens, J., dissenting) (discussing the conventional limitations of Diehr's claim). Had the *Diehr* Court applied the exclusions of pre-solution, post-solution and field of use limitations, it would have had to conclude that the claims were not patent-eligible. *Id.* ("if the Court accepted my reading [of the claim], I feel confident that the case would be decided differently"). Essentially, the *Diehr* Court kept the *ad hoc* rules without appreciating that they were valid only in the context of the point of novelty approach to § 101.

C. *Mayo* Resurrected *Flook* and Extended the *Ad Hoc* Rules

Diehr remained good law for over 30 years, and several million patents were issued based on its approach—until *Mayo*. *Mayo* resurrected *Flook* and returned to what amounts to claim dissection. While citing *Diehr* for the proposition that the claims must be viewed as whole, *Mayo* held that it is proper to determine patent eligibility by identifying an "inventive concept" and applying § 101 only to that element. *Mayo* further extended *Flook's* *ad hoc* rules to include "well-understood, routine, conventional activity," previously engaged in by those in the field, *Mayo*, 132 S.Ct. at 1298. Consideration of whether individual steps are conventional directly contradicts *Diehr*, 450 U.S. at 193. Indeed, the bulk of Diehr's claim was conventional, *Diehr*, 450 U.S. at 207-208 (Stevens, J., dissenting), and thus this rule clearly cannot be correct in all cases.

The conflict between *Flook-Mayo* and *Diehr* has been widely recognized. See Katerina E. Milenkovski, *Prometheus's Patent Ruled a Myth*, American Bar Association Litigation News (May 29, 2012) http://goo.gl/LxksgX ("'Despite quoting heavily from *Diehr* in its *Prometheus* analysis, the Supreme Court nevertheless did exactly what *Diehr* instructed not to do,' according to Robert M. Asher, Boston, co-chair of the Patents Subcommittee of the Section of Litigation's Intellectual Property Litigation Committee."); Eric W. Guttag, *Selective Precedent Amnesia: The Nonsensical Reasoning in the Supreme Court's Mayo Collaborative Services Decision Part 3*, IPWatchdog (March 28, 2012), http://goo.gl/eX2ldL ("Breyer's opinion in *Mayo Collaborative Services* repeatedly doing what this paragraph from *Diehr* says not to do in an analysis of method or process claims under 35 U.S.C. § 101 . . . But frankly such mishandling of binding Supreme Court precedent in *Mayo Collaborative Services* is a huge problem.").

Flook's *ad hoc* rules continue to be used today, but they do not accurately reflect the nature of the inventive process or of how computers operate. The rules against considering claim limitations that are pre-solution or data gathering activity overlooks a variety of situations where the solution is not in the creation of a new formula, but in some other inventive contribution.

For example, the inventive concept can come from identifying, of potentially thousands of variables, which ones are important to solving a known problem and which are not. This is common in many of the sciences. Similarly, pre-solution activity provides a new way of obtaining data for use in an existing algorithm, or specific "pre-processing" steps that beneficially transform the data so that it can be more efficiently used. This was the case in *Arrhythmia Research Technology Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1055 (Fed. Cir. 1992) (pre-processing of the electrocardiographic signal was a "critical feature of the Simson invention."). A rule against post-solution activity likewise improperly disregards situations where the inventive concept is the new use of results of a known algorithm, or a new way of presenting the results. There are many patents based on these kinds of inventive contributions.

A rule against field of use limitations also has unintended consequences. One of the most powerful forms of invention is to apply knowledge developed in one field to an entirely different and unrelated field. "Transforming concepts from one form into another can yield discoveries in any field." Robert and Michele Root-Bernstein, *Sparks of Genius: The 13 Thinking Tools of the World's Most Creative People* 286 (1999). The inventive contribution comes from realizing that a particular mechanism used in one field of technology solves a problem in a different field of technology. In such cases, a limitation that substantively restricts the application of an existing solution to a new field should be acceptable and should not be ignored for purposes of patent eligibility—specifically if it is desired to encourage this type of cross-disciplinary innovation.

None of these situations was at issue in *Benson*, *Flook*, or *Diehr*, and yet the *ad hoc* rules against pre-solution, post-solution, and field of use limitations would exclude these types of inventions as a matter of course. Objective preemption would not automatically invoke these rules to exclude limitations as being insignificant *per se*, but would instead use POSITA to determine whether a limitation is meaningful, regardless of whether it is pre-solution, post-solution, or a field of use.

Another *ad hoc* rule is that computers perform essentially mental steps. "As the Supreme Court has explained, "[a] digital computer . . . operates on data expressed in digits, solving a problem by doing arithmetic as a person would do it by head and hand." *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266, 1277 (Fed. Cir. 2012) (citing *Benson*, 409 U.S. at 65). Computers do not perform even basic arithmetic in the same way a human does. See Benrey at 10-16. Prior to *Benson*, the mental steps doctrine was limited to claims that specifically required human cognition or judgment, and *Benson* extended the doctrine to computers based on the incorrect assumption that they perform calculations as do humans. See Benrey at 25-29.

Further, the use of a general purpose computer to implement an invention should not be discarded as having no contribution to patent eligibility. Section 100(b) of the patent statute expressly contemplates that process claims include a new use of a known process or machine. If a new use were found for a common and conventional mechanical machine, such as a printing press to "print" a food product, one would not ignore a claim limitation reciting the machine in deciding whether a process claim for printing food was statutory. Similarly, there is no logical reason to ignore a general purpose computer or elements recited in a software process claim, and doing so directly contradicts the language and intent of § 100(b). If Congress intended to require that "conventional, routine" elements could not contribute to patent eligibility, it would not have extended the definition of process to include the use of a known "*process, machine*, manufacture, composition of matter," exactly as recited in § 101 (emphasis added).

Finally, the expression *general purpose computer* is often misunderstood. A general purpose computer *does not* mean a computer executing basic software such as a word processor or an Internet browser. Rather, the term refers to the underlying *hardware* architecture of a processor ("CPU"), a memory from which a stored program can be retrieved and executed. See "Computer," http://en.wikipedia.org/wiki/Computer. Once a program is executed by the processor, the computer is in fact operating as a particular machine, essentially a special purpose computer. This is a consequence of the foundational work in computer science by Alan Turing, who proved in the 1930s that a general purpose computer (what he called a "Universal Turing Machine") executing a program can perform the operations of any specific hardware. See Benrey at 33-35; "Universal Turing machine," http://en.wikipedia.org/wiki/Universal_Turing_machine#Stored-program_computer/.

This also demonstrates that the holding in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc) is scientifically correct: "such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *Id.* at 1545.

V. ALICE'S PATENT CLAIMS ARE PATENT ELIGIBLE UNDER OBJECTIVE PREEMPTION

Alice's patent claims recite statutory subject matter under the objective preemption framework.

First, the record shows that a POSITA would be "a person with experience in banking operations and systems, including at least five years experience in the financial services industry with knowledge of and experience in large value trading, settlement, and payment computer systems and methods. This could, for example, be a person with a financial business background who has specified technology requirements for payment systems or other financial systems." JA118 ¶ 6. This is consistent with the classification of Alice's patents in U.S. patent classification 705/37, pertaining to "the trading or exchange of securities or commodities within an organized system."

Second, there was record evidence that a POSITA would understand that the method claims necessarily require a computer to perform the steps, including the creation and adjusting of the shadow credit and debit records. JA128 ¶ 26, JA124 ¶ 17, JA1322 ¶ 29; see *CLS*, 717 F.3d at 1330 (Linn, J., dissenting). POSITA would observe that the 100-plus page patent specification provides an extremely detailed and lengthy description of the computer algorithms, data structures, databases, and screen displays used by the system. JA1325 ¶ 33. Reading the Disclosure of the Invention of U.S. Patent No. 5,970,479, for example, there is no suggestion that the inventors specifically sought to patent an abstract intellectual idea such as credit intermediation *per se*, but only "methods and apparatus," including a recitation of both computer system and a computer-implemented method, both of which recite the use of shadow credit and debit records. JA249-251. Given the detailed descriptions and the disclosure of the invention, POSITA would understand that the computer-implemented shadow records are inherent in the solution, not a mere afterthought. Thus, POSITA would consider Alice's "inventive concept" to be computerized systems and methods for using shadow credit and debit records used by a supervisory institution for managing settlement risk. JA126 ¶ 21. None of these facts or inferences were contradicted by CLS's expert declaration, JA102-115.

Thus, POSITA would not conclude that Alice's patent merely recited an abstract idea. However, for the sake of this analysis it is assumed the claims implicate an abstract idea, such as "reducing settlement risk by effecting trades through a third-party intermediary (here, the supervisory institution) empowered to verify that both parties can fulfill their obligations before allowing the exchange—*i.e.*, a form of escrow." See *CLS*, 717 F.3d at 1286 (Lourie, J., concurring).

POSITA would recognize various limitations as being significant since they allow for practical applications of the abstract idea that do not infringe Alice's claims. For example, POSITA would recognize having both a shadow credit and debit account for every party as one such limitation. This is because a supervisory institution instead could use a single account for each party, similar to the conventional use of a single bank account for both credits and debits. This would still provide a practical way of reducing settlement risk using a third party without coming within the scope of the claims.

The requirement to adjust the credit and debit accounts of each party in chronological order is also a meaningful limitation. POSITA would recognize that the adjustments could be made in a different order, such as largest amounts first, a practice commonly used in banking. While not as effective as the claimed method, it would still be a practical application of the abstract idea.

Given the presumption of validity, all reasonable inferences from these facts must be drawn in Alice's favor. Thus, POSITA would recognize that the claims do not preempt all practical applications of this idea. Accordingly, these claims should be patent eligible.

CONCLUSION

Section 101 is broadly stated precisely because it focuses not on the past, but on the unknowable future. It beckons inventors to create inventions that by definition cannot be predicted. Restrictions on future inventions, particularly through the narrowing of § 101, need to be carefully crafted, and should not discriminate, intentionally or otherwise, against particular technologies.

The patent law must provide clear and objective standards to enable innovators to readily determine whether their inventions are patent eligible, and competitors to practice their existing approaches, as well as to learn and adapt in view of patented inventions. The public benefits from both types of activities.

Objective preemption serves all of these goals. The Court should adopt objective preemption as a methodology for deciding patent eligibility. It should further reverse the decision below and find Alice's claims eligible under § 101.

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BRIEF

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Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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INTEREST OF *AMICUS CURIAE*

The American Antitrust Institute ("AAI") is an independent and non-profit education, research, and advocacy organization devoted to advancing the role of competition in the economy, protecting consumers, and sustaining the vitality of the antitrust laws.[1] These goals could be seriously undermined if the Court's standard for assessing the patent-eligibility of software-implemented inventions does not adhere to the competition policy values rooted in the Court's refusal to permit preemption of abstract ideas. The Court's longstanding distinction between a method or means of causing an effect, and the effect itself, can be a useful framework for advancing a preemption-oriented methodology because it may provide an important clue that a claimed invention improperly preempts an abstract idea.

INTRODUCTION AND SUMMARY OF ARGUMENT

The Court has already determined that software-implemented inventions may constitute patent-eligible subject matter. *Diamond v. Diehr*, 450 U.S.

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[1] The parties have lodged blanket consents to the filing of *amicus* briefs with the clerk. No person other than *amicus curiae* or its counsel authored this brief in whole or in part or made a monetary contribution intended to fund its preparation or submission. AAI is managed by its Board of Directors, with the guidance of an Advisory Board that consists of approximately 125 prominent antitrust lawyers, law professors, economists, and business leaders. AAI's Board of Directors has approved this filing for AAI; individual views of members of the Board of Directors or the Advisory Board may differ from AAI's positions.

175 (1981). The question in this case is under what circumstances software-implemented methods and systems (collectively "software solutions") may be found ineligible as directed to unpatentable abstract ideas. The animating concern of the abstract-idea exclusion is that upholding certain patent claims "would risk disproportionately tying up the use" of "the basic tools of scientific and technological work," *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293-94 (2012). Accordingly, the Court has struck down patent claims that broadly preempt "fundamental economic practice[s]," *Bilski v. Kappos*, 130 S. Ct. 3218, 3231 (2010), because allowing such patents would "tend to impede innovation more than it would tend to promote it." *Mayo*, 132 S. Ct. at 1293. Preemptive patents create this socially harmful balance of tendencies because they shrink inventors' and entrepreneurs' access to "the storehouse of knowledge of all men." *See Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

It is easy to understand why a claim directed to an abstract idea, as compared to an application of an abstract idea, should not be patentable, and the Court has always made clear that a claim is ineligible if it manifests itself by coverage so broad that "'it matters not by what process or machinery the result is accomplished.'" *Gottschalk v. Benson*, 409 U.S. 63, 68 (1972) (quoting *O'Reilly v. Morse*, 56 U.S. 62, 113 (1853)). Confusion persists, however, as to when and under what circumstances an abstract idea is sufficiently grounded in some application to warrant patentability. The Court's longstanding distinction between a method or means of causing an effect, and the effect itself, *Corning v. Burden*, 56 U.S. 252, 268 (1853), can be a useful framework for advancing a preemption-oriented methodology that is focused on whether a patent claims an abstract idea rather than a concrete application of an abstract idea.

The "method or means" versus "results or effects" distinction is useful in this regard because it implicitly incorporates the concept of causality. A patent claim covering a process to be practiced or a product to be made and used is directed to the method or means of causing a beneficial effect if it *causes* some beneficial *change* in the state of the world as a consequence of its performance. Conversely, a patent claim purporting to cover a property or principle that obtains in the world, *regardless of whether it is preceded by an intervening act*, is directed to the result or effect the property or principle already entails.

This causal relationship between "methods or means" and "results or effects" can help identify a computational process or machine claim that is particularly vulnerable to an abstraction challenge. When a claim to a software solution recites procedural steps or system elements without limitation to any causal properties whatsoever, it is very likely that the claim fails as directed to results or effects that can be derived mathematically from the stipulated properties of a generic computer. In contrast, when a claim delineates procedural steps or system elements in causal terms, the software solution likely provides a specific method or means of causing a computer to produce those results. The latter may well recite an application of an abstract idea to a new and useful end, but the former very likely recites an abstract idea itself, perhaps with a field of use limitation or insignificant pre- or post-solution activity. They are distinguishable by the fact that the efficacy of the latter will typically be verifiable only by empirical observation, whereas the efficacy of the former will always be verifiable by mathematical proof.

ARGUMENT

I. THE PURPOSE OF THE ABSTRACT-IDEA EXCLUSION IS TO PREVENT UNDUE HARM TO COMPETITION AND INNOVATION

The animating concern of the abstract-idea exclusion is that upholding abstract patent claims "would risk disproportionately tying up the use" of "the basic tools of scientific and technological work." *Mayo*, 132 S. Ct. at 1293-94. This "preemption" concern is, at its core, a competition policy concern, and the Court has noted that the use of overbroad abstractions in a patent claim can result in unwarranted economic monopoly. *LeRoy v. Tatham*, 55 U.S. 156, 175 (1852) (such claims, "by creating monopolies, would discourage arts and manufactures, against the avowed policy of the patent laws"). More fundamentally, patents that preempt abstract intellectual ideas harm all competition by interfering with access to the building blocks of competitive innovation. *See* Mark A. Lemley, *Industry-Specific Antitrust Policy for Innovation*, 2011 Colum. Bus. L. Rev. 637, 652 (2011) (explaining that competition law and policy "has a claim to co-equal status with patent law as a promoter of innovation" and arguing that "the interaction between the two should reflect that status"). It is for this reason that the Court has struck down patent claims that broadly preempt "fundamental economic practice[s]." *Bilski*, 130 S. Ct. at 3231.

As the Court's precedent makes clear, Alice's claims should be found patent-ineligible if they would risk disproportionately tying up the use of a fundamental economic practice. The district court characterized Alice's claims as "directed to . . . employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk." *CLS Bank Int'l v. Alice Corp. Pty., Ltd.*, 768 F. Supp. 2d 221, 243 (D.D.C. 2011). The court concluded that they would "effectively preempt the use of an electronic intermediary to guarantee exchanges across an incredible swath of the economic sector." *Id.* at 246. Although a plurality of the Federal Circuit agreed, *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1287 (Fed. Cir. 2013) (Lourie, J., concurring) ("upholding Alice's claims to . . . financial intermediation 'would pre-empt use of this approach in all fields'" (quoting *Bilski*, 130 S. Ct. at 3231)), several other judges would have found the system claims patentable because they recite a process implemented in a machine, a factor strongly indicative of patentable subject matter. *Id.* at 1305 (Rader, J. et al., concurring in part and dissenting in part) ("If tying a method to a machine can be an important indication of patent-eligibility, it would seem that a claim embodying the machine itself, with all its structural and functional limitations, would rarely, if ever, be an abstract idea."); *id.* at 1316 ("*A machine is a concrete thing, consisting of parts* . . . . [T]he requirement of specifying the particular limitations and structure of a claimed machine meaningfully limits the claim, such that it amounts to more than the principle or idea that it embodies.") (citation and internal quotation marks omitted).

Amicus AAI respectfully suggests that the dissenting judges' emphasis on the machine element of Alice's system claims is misplaced, and the Federal Circuit's fractured *en banc* ruling demonstrates a need for this Court to go further than it did in *Bilski* in articulating that preemption is the broadly applicable limiting principle for the scope and specificity of patentable software-implemented inventions. Lower courts that elevate the machine element of a system claim from "clue," *Bilski*, 130 S. Ct. at 3227, to dispositive proof of eligibility depart from the preemption principle underlying the Court's abstract-idea jurisprudence. While the plurality assigned the preemption principle its proper role, *see, e.g., CLS Bank*, 717 F.3d at 1277 ("the Supreme Court's foundational § 101 jurisprudence . . . turns primarily on the practical likelihood of a claim preempting a fundamental concept . . . [and] we would adopt this approach to address the abstractness of the specific computer-implemented inventions presented in this case"); *id.* at 1280 ("foremost is an abiding concern that patents should not be allowed to preempt the fundamental tools of discovery"), the remaining *en banc* opinions did not address the impact of Alice's claimed patents on the markets in which they would operate. It is this preemption risk that transforms the patentable subject matter inquiry from a battle over words into a realistic inquiry into how patents lacking specificity may disrupt competition and innovation.

This Court should reaffirm the preemption-oriented methodology of *Benson*, *Flook* and *Diehr* with appropriate emphasis on the harmful market effects of overbroad patents, especially in the software context. *See* Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex. L. Rev. 1991, 2028-29 (2007); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in 1 *Innovation Pol'y and Econ.* 119, 120 (2000); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 Sci. 698 (1998). The Court expressed concerns about this harm in both *Benson* and *Flook*. *See, e.g.*, *Benson*, 409 U.S. at 73 (calling on Congress to act in light of the "wide variety of views" and "technological problems" engendered by software patents); *Parker v. Flook*, 437 U.S. 584, 595 (1978) (calling attention to need for more empirical findings by Congress before expanding availability of software patents). And in ensuing decades, the academic community has validated these concerns—particularly with respect to overbroad software patenting, which extends to financial method patents. *See, e.g.*, Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wisc. L. Rev. 905, 928, 961 (2013) (noting that "[s]oftware patents are widely acknowledged as creating a large number of problems for the patent system" and that "in software in particular, it is competition and not market dominance that spurs innovation" (footnote omitted)); James Bessen & Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk* 187-190 (2008) (describing the problems of granting patents on software-related claims that are too abstract); Robert P. Merges, *Software and Patent Scope: A Report from the Middle Innings*, 85 Tex. L. Rev. 1627, 1627 (2007) ("firms are integrating patents into the competitive fabric of the industry").

II. THE COURT'S LONGSTANDING DISTINCTION BETWEEN A "METHOD OR MEANS" FOR BRINGING ABOUT A DESIRED EFFECT AND THE EFFECT ITSELF CAN BE USEFUL IN ABSTRACT-IDEA ANALYSIS

Amicus AAI does not offer a panacea for the "irresolution" that "irreconcilably fractured" the Federal Circuit. *CLS Bank*, 717 F.3d at 1321 (Newman, J., concurring in part and dissenting in part); *id.* at 1314 (Moore, J., dissenting in part). That would require a clear, workable legal standard that distinguishes all sufficient system claims that are concrete applications of abstract ideas from all insufficient system claims that preempt abstract ideas. While this Court has clarified that the machine-or-transformation test is "a useful and important clue," yet not a definitive test for patent-eligibility, *Bilski*, 130 S. Ct. at 3227, it has not delineated in detail the kinds of limitations that would differentiate a sufficiently "particular" machine from a machine that improperly preempts an abstract idea.

In the software solutions context, another useful and important clue may reside in the Court's centuries-old admonition from *LeRoy*, *Corning*, and *Diehr* that a patent is granted "'for the discovery or invention of some practical method or means of producing a beneficial result or effect . . . and not for the result or effect itself,'" *Diehr*, 450 U.S. at 182 n.7 (quoting *Corning*, 56 U.S. at 268); *LeRoy*, 55 U.S. at 175 ("A patent is not good for an effect, or the result of a certain process, as that would prohibit all other persons from making the same thing by any means whatsoever."). Virtually all patent claims use abstract terms at some level of generality to describe the kinds of processes and products they purport to cover, yet relatively few raise § 101 concerns. Partly, this is because patent claims are frequently limited to a particular method or means for bringing about a desired effect and not the effect itself. But it is worth paying attention when they may not be so limited.

The Court's longstanding distinction between a method or means of causing an effect, and the effect itself, can be a useful framework for advancing a preemption-oriented methodology because it implicitly invokes the concept of causality. The subject matter of every patentable invention must be a practicable undertaking—a process to be practiced or a product to be made and used—that is capable of *causing* some beneficial change in the state of the world as a consequence of its performance. *See Benson*, 409 U.S. at 67 (distinguishing natural phenomena and abstract ideas from their "'application . . . to a new and useful end.'" (quoting *Funk Bros.*, 333 U.S. at 130)); *cf. id.* at 68 (claim to a natural phenomenon manifests itself by coverage so broad that "'it matters not by what process or machinery the result is accomplished'" (quoting *Morse*, 56 U.S. at 113)).

A property or principle that obtains in the world regardless of whether or not such an intervening act takes place, in contrast, may be better characterized as "'part of the storehouse of knowledge of all men ...

free to all men and reserved exclusively to none.'" *Bilski*, 130 S.Ct. at 3225 (quoting *Funk Bros.*, 333 U.S. at 130 (ellipsis in original)); *see Flook*, 437 U.S. at 593 n.15 (claimed invention unpatentable where it was an expression of a scientific principle that "reveals a relationship that has always existed," like Newton's equation expressing the law of universal gravitation); *id.* at 593 & n.15 ("merely heretofore unknown" expression of a "theretofore existing phenomenon or relationship" is not the kind of "'discover[y]' that the statute was enacted to protect" (citatation and internal quotation marks omitted)); *Funk Bros.*, 333 U.S. at 131 (rejecting claim to combination of bacteria species because "[t]hey serve the ends nature originally provided and act quite independently of any effort of the patentee"). Claims that effectively cover all applications of such a property or principle in a particular field of use or technological environment, and claims that additionally recite only insignificant extra-solution activity, have something in common: they are more accurately characterized as directed to effects rather than methods or means that *cause* effects. *See Bilski*, 130 S.Ct. at 3231.

In the field of mathematics, the Pythagorean Theorem is a paradigmatic example of an unpatentable abstract idea. *See Flook*, 437 U.S. at 90; *cf.* Stewart Shapiro, *Thinking About Mathematics: The Philosophy of Mathematics* 66-67 (2000) (treating mathematical objects as paradigmatic examples of noncausal abstractions). The Pythagorean Theorem does not *cause* the square of the hypotenuse of a right triangle to be the sum of the squares of the legs, although it *explains* why this is so. Nor was this proposition *caused* by Pythagoras or by any of the hundreds of other mathematicians who have furnished proofs over the centuries. *See* Elisha S. Loomis, *The Pythagorean Proposition* (1968) (presenting 367 ways of proving the Pythagorean Theorem). Rather, the Pythagorean Theorem and its proofs simply reveal a relationship that has always existed among the sides of a right triangle.

Some applications of the Pythagorean Theorem have been deemed patentable. For example, the "Cube Puzzle With Moving Faces" is a patented product that can be made and used for beneficial entertainment and educational purposes. *See* U.S. Patent No. 4,872,682 (filed Nov. 17, 1987). It includes springs for creating frictional forces between the sliding pieces and the channels in which they slide as the faces of the cube are turned manually. *Id.* at col. 4. These and other built mechanisms for transmitting forces among the cube components can be accurately characterized as means for *causing* the beneficial behavior of the cube. This is true even though the Pythagorean Theorem can be used to verify that a slider in the middle layer of the cube is dimensioned so that it will not slide out of the mechanism when the top or bottom layer is rotated. *Id.* at cols. 8-9. The claimed cube puzzle is a patent-eligible "method or means" for causing beneficial configurations when its faces are rotated by manual forces.

In contrast, consider a hypothetical patent claim directed to a kinematic chain comprising three sequentially linked members each having a given length, the longest of which is the square root of the sum of the squares of the two shorter lengths, whereby the members are constrained to form a right triangle when the linkage is closed.[2] If the term "member" in such a claim refers to any structural element capable of being modeled geometrically as a line segment of a given length without limitation as to the forces that may operate on the member in use, then the claim would effectively preempt all uses of the Pythagorean Theorem in the field of mechanical linkages. The claim should therefore be found unpatentable for being directed to an effect itself rather than a "method or means" of causing the effect.

As the Pythagorean Theorem examples illustrate, the "method or means" versus "result or effect" distinction invites inquiry into whether a machine claim defines its elements using "causal" properties or solely in terms of their "noncausal" (e.g., geometric and kinematic) properties. A claim is likely abstract if it would purport to cover those "noncausal" properties without limitation, no matter "'by what process or machinery the result is accomplished.'" *Benson*, 409 U.S. at 68 (quoting *Morse*, 56 U.S. at 113). Such a claim would say nothing about the physical configurations and types of elements needed to ensure reliable operation, *see* Oleg Vinogradov, *Fundamentals of Kinematics and Dynamics of Machines and Mechanisms* 1-3 (2000), and nothing about the

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[2] Kinematics is "the study of motion without regard to the forces that produce the motion." Philip Kosky et al., *Exploring Engineering: An Introduction to Engineering and Design* 69 (3d ed. 2013). A kinematic chain is a set of rigid bodies ("links") coupled by pairwise joints that constrain their motion relative to each other. *See* Jorge Angeles, *Fundamentals of Robotic Mechanical Systems: Theory, Methods, and Algorithms* 129-30 (3d ed. 2007).

"causal" relationships governing the machine's dynamic behavior in use, *see* Robert G. Sachs, *The Physics of Time Reversal* 31 (1987). Where claim elements are defined solely in "noncausal" terms, such as by their stipulated mathematical interrelationships, this might be an important indicator that a machine claim is not directed to a method or means of causing a beneficial result or effect, but rather is directed to the result or effect itself.

III. ALICE'S PATENT CLAIMS DO NOT RECITE CAUSAL PROPERTIES THAT BRING ABOUT INTERMEDIATED SETTLEMENT

A. A Claimed Software Solution Is Not Directed to a "Method or Means" If It Is Amenable to Mathematical Verification

If patentability is warranted for the "method or means" of causing a result or effect, and not the result or effect itself, eligible patent claims should be limited in scope and directed to specific entities and processes whose effects in the real world must be observed empirically, rather than derived mathematically from stipulations. This is because, *a fortiori*, results that can be observed only empirically must be the result of some intervening act, whereas results that may be derived mathematically from stipulations might simply be extant, independent of the activity of one who makes and uses a claimed invention.

As the discussion below will show, Alice's software solution presents computational procedures with mathematically verifiable properties (and a social interpretation of its data elements that is apparently of considerable interest to the foreign exchange banking community), but it does not offer a "method or means" of causing any results of those procedures. While the abstract idea doctrine applies to more than just mathematical formulas, *see* Respondents' Br. 19-23, software-solution claims that describe only computational procedures subject to mathematical verification should be in a particularly suspect class with respect to abstract-idea jurisprudence. As the Court has already acknowledged, a mathematical property cannot support a patent.[3]

Where a software solution, to run on a computer effectively, must be designed to accommodate at least some of the causal influences it has on the computer and the causal consequences of its application on the computer, the solution can accurately be deemed "causal."[4]

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[3] *Flook* acknowledges that an essentially mathematical invention is not susceptible to examination against prior art under the traditional tests for novelty and nonobviousness. Even previously unknown mathematical properties must be "assumed to be within the prior art" at the outset of a patentability determination. 437 U.S. at 594. Furthermore, a nonobviousness inquiry into the level of ordinary skill in the art, *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), is misplaced where the art in question, and the field of knowledge being advanced by the patent disclosure, is not one of the "useful Arts," but mathematics. *Id.* at 6 ("Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which by constitutional command must 'promote the Progress of … useful Arts.'" (quoting U.S. Const., art. I, § 8, cl. 8)). Under this reasoning, a mathematical property, no matter how significant or surprising, should be barred from patent-eligibility in light of its categorical unsuitability for examination against prior art under the traditional tests for patentability. *See In re Bilski*, 545 F.3d 943, 1013 (Fed. Cir. 2008) (Rader, J., dissenting) ("[A]n abstract claim would appear in a form that is not even susceptible to examination against prior art under the traditional tests for patentability.").

But some software solutions are designed to solve formalized problems using idealized and generic computational models. These solutions assume away causal factors that might influence the execution of the program. *See* James H. Fetzer, *Program Verification: The Very Idea,* 31 Comm. ACM 1048, 1057 (1988) (explaining that even the outcome of a four-line Pascal program "obviously depends on various different causal factors, including the characteristics of the compiler, the processor, the printer, the paper and every other component whose specific features influence the execution of such a program"). Unlike the correctness of causal solutions, the correctness of solutions that solve these formalized problems is demonstrable through mathematical proof. Such software solutions are properly characterized as employing mathematical properties, which computer scientists recognize as abstract contributions to mathematical knowledge. *See id.* at 1056.[5]

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[4] Although some contend otherwise, *see* Ben Klemens, *Math You Can't Use: Patents, Copyright, and Software* 35, 44–47 (2005), not all software-implemented inventions are reducible to abstract mathematical discoveries, *see* Andrew Chin, *On Abstraction and Equivalence in Software Patent Doctrine: A Response to Bessen, Meurer and Klemens*, 16 J. Intell. Prop. L. 197, 227-37 (2009).

[5] While there has been considerable debate in the computer science community as to the range of software solutions that are amenable to mathematical verification, *see* Donald MacKenzie, *Mechanizing Proof* 197-218 (2001), mathematical techniques are typically used to verify algorithms (whether expressed in natural language, pseudocode, or flowcharts) designed for abstract

For example, consider a claim purporting to cover a system for reconciling a checking account comprising an arithmetic unit configured to add deposits (D) and interest (I) to, and deduct checks (C) and withdrawals (W) from, the previous month's balance (B_0). This claim is broad enough to cover any software solution that produces a result B_1 satisfying the mathematical property $B_1=B_0+D+I-C-W$, where the field of use is limited to the reconciliation of checking accounts (wherein the terms "deposits," "interest," etc. have their customary interpretation in the banking industry). The recitation of the generic term "arithmetic unit" does not limit the claim to any causal method or means of bringing about this result, because the correctness of the claimed software solution logically follows from the arithmetic unit's stipulated properties (namely, that it can correctly add and subtract). Just as the length of a hypotenuse under the Pythagorean Theorem explains but is not the cause of a surveyor's measurement, *see Flook*, 437 U.S. at 590, a computation of B_1 satisfying the mathematical property $B_1=B_0+D+I-C-W$ is not the cause of the checking account's reconciliation, although it may explain to someone in the banking industry why the account's balance is or is not correct. Such a claim should be held patent-ineligible as preempting the use of the mathematical property $B_1=B_0+D+I-C-W$ in the field of checking account reconciliation.

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machines whose causal properties are stipulated by definition, such as those disclosed and claimed by Alice. Fetzer, 31 Comm. ACM at 1058.

B. Alice's Claimed Software Solutions Are Mathematically Verifiable and Not Causally Limited By the Social Interpretations That the Financial Industry Would Give To Their Data Elements

Alice's four patents in suit are based on highly similar specifications that, despite their length, provide essentially no disclosure regarding the causal requirements of the system for which the claimed software solution has been designed. While various specific product models are named in the specification, these are intended to be merely exemplary, and the invention is not directed to any of the named models. Instead, the disclosed software solution is designed to run on a "generic 'system'" comprising a collection of "data processing units," "mass data storage units," "communications controllers," "communications hardware products," and "information recordal devices," all of which may occur in "many varied configurations, relating not only to the number and types of stakeholders, but also the 'architectures' realisable [sic] by the system hardware and software in combination." U.S. Patent No. 5,970,479 cols. 7-8 (filed May 28, 1993); U.S. Patent No. 6,912,510 cols. 6-8 (filed May 9, 2000); U.S. Patent No. 7,149,720 cols. 7-8 (filed Dec. 31, 2002); U.S. Patent No. 7,725,375 cols. 6-8 (filed June 27, 2005). This concession to "generic" specifications that may occur in "many varied configurations" is effectively an open acknowledgment that Alice's claimed software solution is based on abstract types of computer system components with stipulated properties, such as the ability of a mass storage unit to store mass data. In other words, Alice claims a software solution that will work equally well on any hard drive, optical drive, RAID system (and so on for the other recited system elements), much like the unpatentable "1+1=2" formula will work equally well on a slide rule, abacus, pocket calculator or iPhone app.

In support of its claims, Alice's specifications at no point disclose or even suggest any causal characteristics of the data processing, communications, and recordal devices, all of whose specific features would have to influence the execution of the contemplated software on an actual system. *See* Fetzer, 31 Comm. ACM at 1057-58. In particular, Alice's data processing algorithms are disclosed through a combination of flowcharts and screenshots depicting user views of the system, all of which specify computational behavior that is amenable to mathematical verification. *See id.* at 1058 (distinguishing between the mathematical verifiability of encodings of algorithms that can and cannot be compiled for purposes of assessing abstraction in the computer science context). While the flowcharts might appear impressively detailed, this disclosure of mathematically verifiable data processing procedures is essentially an elaborate presentation of various mathematical properties that have particular salience in the context of Alice's approach to intermediated settlement. But as in the checking account reconciliation example above, these results of mathematical inferences are not the cause of any intermediated settlement or escrow services.

The process claims, which a 7-3 majority of the en banc court held to be unpatentably abstract, recite various data processing procedures that take place over the course of a day. *See, e.g.*, U.S. Patent No. 5,970,479 col. 33 (filed May 28, 1993). The data elements involved in these procedures are recited in terms meaningful to the community of stakeholders in the trading of risk management contracts, *see id.* (reciting "credit record," "debit record," "shadow credit record," "shadow debit record," "start-of-day balance," "transaction," "adjustment," "credits" and "debits"). These social interpretations, however, have no effect on the mathematically specified behavior of a system performing the disclosed and claimed data processing procedures.

The system claims, on which the Federal Circuit was equally divided, describe the components involved in performing these data processing procedures in similarly generic terms. *See, e.g.*, U.S. Patent No. 7,725,375 cols. 1 & 26 (filed June 27, 2005) (reciting "a first party device," "a data storage unit," "a computer," and "a communications controller"). As the *en banc* plurality noted, these structural elements are not described as practical methods or means of producing beneficial results or effects, but instead are defined solely in terms of the results or effects themselves: a data storage unit stores data, a computer computes, and a communications controller controls communications, all without regard to the kinds of causal processes involved in supporting these functions. *See CLS Bank*, 717 F.3d at 1290 (Lourie, J., concurring) ("Instead of wholly implied computer limitations, the system claims recite a handful of computer components in generic, functional terms that would encompass any device capable of performing the same ubiquitous calculation, storage, and connectivity functions required by the method claims."). As such, these elements are of no more help in establishing causal properties than the abstract kinematic structural term "member" in a claim preempting all structural uses of the Pythagorean Theorem. Contrary to Judge Moore's view, Alice is not "walk[ing] up to the § 101 gate holding a computer in [its] arms," *id.* at 1321 (Moore J., dissenting in part) (emphasis omitted), it's purporting to hold *every* computer in its arms.

The asserted claims recite data processing systems and methods for performing various calculations and transmissions involving formally specified data elements. The remaining claim language merely provides instructions as to how these calculations, transmissions and data elements are to be understood by the community of stakeholders involved in the simultaneous exchange of obligations through an intermediary to minimize risk. While this interpretive context confines the preemptive effect of Alice's claims to the financial industry, field of use limitations give Alice no cover. *See Diehr*, 450 U.S. at 192 n.14 ("A mathematical formula does not suddenly become patentable subject matter simply by having the applicant acquiesce to limiting the reach of the patent for the formula to a particular technological use." (citing *Flook*, 437 U.S. at 586)). Alice's claims are not limited by any disclosure as to the causal processes within the financial institutions involved in an intermediated settlement.

CONCLUSION

The Court should clarify that preemption is the foremost concern of the abstract-idea exclusion. The

Court's longstanding distinction between a method or means of causing an effect, and the effect itself, can be a useful framework for advancing a preemption-oriented methodology that is focused on whether a patent claims an abstract idea or a concrete application of an abstract idea. Alice's patent claims are not limited to any causal methods or means for bringing about intermediated settlement, but instead are directed to the results of mathematical properties derived from stipulations about a generic computer. This strongly suggests Alice's claims are unpatentably abstract.

Respectfully submitted,

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IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

—v.—

CLS BANK INTERNATIONAL, ET AL.,
Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF THE AMERICAN CIVIL LIBERTIES UNION AS AMICUS CURIAE IN SUPPORT OF RESPONDENTS

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INTEREST OF AMICUS[1]

The American Civil Liberties Union ("ACLU") is a nationwide, nonprofit, nonpartisan organization with more than 500,000 members dedicated to the principles of liberty and equality embodied in the Constitution and this nation's civil rights laws. Since its founding in 1920, the ACLU has frequently appeared before this Court in cases involving the First Amendment, both as direct counsel and as *amicus curiae*. It also represented petitioners in the last case arising under Section 101 of the Patent Act decided by this Court, *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013). This case raises fundamental issues regarding freedom of thought, inquiry, and speech that implicate important constitutional values. The proper resolution of this case is, therefore, a matter of significant concern to the ACLU and its membership throughout the country.

STATEMENT OF THE CASE

This is a challenge to a series of computer-related patent claims on the grounds that the claims reach unpatentable subject matter. Alice Corporation ("Alice") controls a number of patents directed at the resolution of settlement risk in financial transactions. Pet. App. 3a. Alice's patents address that risk by relying on a trusted third party to record the financial transactions occurring between two parties and to ensure that the parties' accounts are irrevocably adjusted at the end of the day to reflect any overall credit or debit – what the courts below have described as a form of escrow. Pet. App. 28a.

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[1] The parties have lodged blanket letters of consent to the filing of *amicus* briefs with the Clerk of the Court. No counsel for a party authored this brief in whole or in part, and no person other than *amicus curiae*, its members, or its counsel made a monetary contribution to its preparation or submission.

Alice obtained three types of related patent claims: method claims, claims on computer-readable media, and claims on the computer system. Claim 33 of the '479 Patent is representative of the asserted method claims:

> 33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:
>
> (a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
>
> (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;
>
> (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being

> less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and
>
> (d) at the end-of-the-day, the supervisory institution instructing ones [*sic*] of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

Pet. App. 26a-27a.

In other words, Alice claims a method with the following steps: 1) create shadow or secondary financial records for two parties; 2) obtain the starting balance information; 3) add and subtract from the parties' balances based on transactions that occur during the day, but disallow any transactions for which the parties do not have adequate funds according to the secondary records; and 4) instruct the exchange institution to execute a final credit or debit on the parties' accounts at the end of the day to reflect the balance from the secondary records. On its face, this method could be carried out using pencil, paper, and telephone; the parties, however, agreed that the patent provides that a computer will facilitate the process, although there is no specific software code or new computer technology (beyond a computer that is capable of implementing the method) that is claimed. Pet. App. 27a-28a.

The media and system claims are derivative of the method claims. The media claims are on any computer-readable medium, such as a computer disk, that contains a program code to carry out the method. Pet. App. 32a-33a. Similarly, the system claims are on any "data processing systems" that comprise a data storage unit that contains the secondary credit and debit records and a computer that can carry out the described method of escrow. Pet. App. 35a-36a.

CLS Bank International and CLS Services Ltd. ("CLS Bank") filed suit against Alice seeking a declaratory judgment of patent noninfringement, invalidity, and unenforceability, and Alice counterclaimed. Pet. App. 4a. The U.S. District Court for the District of Columbia invalidated all of the challenged claims under Section 101, concluding that Alice's method claims "are directed to an abstract idea of employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk." Pet. App. 6a, 214a. The court invalidated the system and media claims for the same reasons, concluding that the abstract concept at the heart of the method claims would be monopolized through the media and system claims. Pet. App. 6a-7a, 231a, 236a-37a.

Upon appeal, a divided panel of the U.S. Court of Appeals for the Federal Circuit reversed, upholding all of the patent claims. Pet. App. 132a-33a. The Federal Circuit granted CLS Bank's petition for en banc rehearing, and issued a per curiam affirmance. Pet. App. 1a-2a, 239a-41a. Seven of the ten judges affirmed the district court's decision that the method and media claims are patent-ineligible, Pet. App. 2a-3a, and an evenly split court affirmed the district court's ruling on the system claims, Pet. App. 1a-2a. The court also filed five concurring and dissenting opinions, along with "additional reflections" by Chief Judge Rader. Pet. App. 2a (Lourie, J., concurring), Pet. App. 41a (Rader, C.J., concurring in part and dissenting in part), Pet. App. 85a (Moore, J., dissenting in part), Pet. App. 99a (Newman, J., concurring in part and dissenting in part), Pet. App. 113a (Linn, J., dissenting), Pet. App. 126a (Rader, C.J., additional reflections).

This Court then granted Alice's petition for certiorari on the following question: "Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?"

SUMMARY OF ARGUMENT

This case can be resolved based on the Court's existing Section 101 precedent prohibiting patents on "abstract ideas." We do not repeat those arguments here. Instead, this brief highlights how the prohibition against patenting abstract ideas that this Court has developed as a matter of statutory interpretation is animated and compelled by core constitutional values embodied in both the First Amendment and Article I's mandate that "patents promote the Progress of Science."

The impact of the First Amendment on the patent system has rarely been addressed by either the Patent Office or the courts. Like all Article I powers, however, the government's authority to issue patents is subject to the constraints of the First Amendment. The tension between the First Amendment and an overbroad grant of intellectual property rights is perhaps more obvious in copyright, where expression is the very subject matter of copyright protection. It is not surprising, therefore, that copyright law has integrated First Amendment accommodations in significant ways, including through the fair use doctrine and the distinction between ideas and expression. But, overbroad patents can also undermine the marketplace of ideas and the free flow of information that the First Amendment was designed to preserve, as this case demonstrates and as *Myriad Genetics* implicitly recognized. Like the fair use doctrine, therefore, the abstract ideas doctrine serves as a constitutional safety valve by disallowing patents on pure knowledge, thought, and speech.

Because Alice's patent claims monopolize knowledge, thought, and speech, they are invalid as a matter of patent law, which can and must be construed to avoid the constitutional problems that would otherwise arise if the patents were upheld under Section 101. Alice's method claims patent the economic practice of using a third party to guarantee financial exchanges, a form of escrow. Just as this Court invalidated the patents involved in *Bilski* because they impermissibly patented the abstract idea of hedging risk, *Bilski v. Kappos*, 130 S. Ct. 3218, 3229-32 (2010), Alice's claims exclude others from using the concept of escrow and improving on it. The fact that Alice's method claims are implemented by a computer does not change this analysis; regardless of whether the financial reconciliation at the end of each day is accomplished by computer or pencil and paper, the practical effect of the patent is still to monopolize an idea. *See Gottschalk v. Benson*, 409 U.S. 63, 67-68, 71-72 (1972). Others cannot devise new software code or computer design to execute the process of settling risk relying on a third party, or add steps that would make the method more effective or tailored to a specific context without risking infringement liability.

Alice's attempt to narrow the definition of "abstract ideas" to "fundamental truths" that would include mathematical formulas, while advocating for the patenting of other "disembodied concepts," compounds the constitutional problems. Neither patent law nor the First Amendment permits the government to establish a hierarchy of knowledge in this fashion.

Alice's reliance on computer implementation to save its claims is also troubling because programming code itself deserves First Amendment protections. Alice's patents stop others from developing programming code that addresses settlement risk through a third party, and that in turn threatens to chill expressive communication among programmers. Given the risk of patent liability, patents that cover all possible forms of software can be used to restrict protected speech.

The media and system claims are invalid for the same reasons as the method claims. In this case, it does not matter whether the government-granted monopoly on thought, knowledge, or speech takes the form of a patent claim on a method, machine, or article of manufacture, because all of these claims are on the abstract idea of addressing settlement risk though a third party. The media and system claims do not have any additional features that limit encroachment on thought and speech.

If including computer implementation in a patent claim could automatically render any abstract idea patent-eligible – as Alice contends – then almost any idea capable of being expressed in code could be patented. The Court should therefore take this opportunity to reaffirm Section 101's central role as a guarantor of breathing space for what the Constitution protects: freedom of thought and speech, as well as promotion of scientific and technological innovation.

ARGUMENT

Amicus agrees with CLS Bank that these patents cannot survive Section 101 of the Patent Act. This brief highlights how First Amendment doctrine provides a basis for analyzing patent law's regulation of what this Court's Section 101 jurisprudence has referred to as "abstract ideas." By construing Section 101 to bar the patent claims in this case, the Court can and should avoid the constitutional problems that would otherwise arise if these claims are allowed to stand. *See, e.g., Skilling v. United States*, 130 S. Ct. 2896, 2929-30 & n.40 (2010); *NLRB v. Catholic Bishop of Chicago*, 440 U.S. 490, 500-01 (1979). However, even if these patents survive scrutiny under the Patent Act, they impermissibly claim thought, knowledge, and speech in violation of the First Amendment, and interfere with scientific inquiry and technological advancement.

I. PATENT LAW CANNOT BE USED TO MONOPOLIZE ABSTRACT IDEAS, THOUGHT, AND SPEECH WITHOUT VIOLATING THE CONSTITUTION.

The structure of intellectual property is created by Article I, section 8, clause 8 of the Constitution, which covers copyright and patents: Congress has the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." Like other legislative powers conferred by Article I, the power to award copyrights and patents is limited by the First Amendment. In copyright, where the potential conflict between copyright law and the First Amendment is more obvious, the Supreme Court has suggested that the First Amendment requires doctrines, like the idea/expression distinction, that are incorporated into the statute. *Eldred v. Ashcroft,* 537 U.S. 186, 219 (2003); *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 556 (1985). *See also Salinger v. Colting*, 641 F. Supp. 2d 250, 255 (S.D.N.Y. 2009), *vac'd on other grounds*, 607 F.3d 68 (2d Cir. 2010); *Maxtone-Graham v. Burtchaell*, 631 F. Supp. 1432, 1435-36 (S.D.N.Y. 1986).

Although the Section 101 doctrine prohibiting patenting of abstract ideas and natural phenomena has not been described previously as compelled by the First Amendment, there can be little doubt that patents giving control over intellectual concepts and abstract knowledge or ideas – and thus limiting free thought – would violate the First Amendment. The ability to think without constraint is an essential attribute of human autonomy and a cornerstone of the First Amendment. *See* Laurence Tribe, *American Constitutional Law* § 12-1 (2d ed. 1988); Thomas Emerson, *The System of Freedom of Expression* 6 (1970). In Justice Harlan's words, "No other approach would comport with the premise of individual dignity." *Cohen v. California*, 403 U.S. 15, 24 (1971). Or, as Justice Brandeis famously stated in an opinion joined by Justice Holmes, the First Amendment protects the "freedom to think as you will and to speak as you think." *Whitney v. California*, 274 U.S. 357, 375 (1927) (Brandeis, J., concurring). Echoing that theme, *Palko v. Connecticut*, 302 U.S. 319, 326-27 (1937), described "freedom of thought and speech" as "the matrix, the indispensable condition, of nearly every other form of freedom." And *Griswold v. Connecticut* said, "The right of freedom of speech ... includes not only the right to utter or to print, but the right to ... freedom of inquiry, freedom of thought ...." 381 U.S. 479, 482 (1965). *See also United States v. Reidel*, 402 U.S. 351, 355-56 (1971); *Stanley v. Georgia*, 394 U.S. 557, 564-66 (1969).

The unhindered potential to consider ideas, intellectual concepts, and abstract knowledge is necessary for freedom of thought and speech. The vast majority of patents do not directly target thought or speech, and for that reason, courts generally have not needed to examine the First Amendment implications of patent law. However, this Court has recently invalidated a method patent in part on the ground that it attempted to claim a thought process, much like the claim at issue in this case. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1302 (2012) (invalidating claims for method of determining drug efficacy because they "tell a treating doctor to measure metabolite levels and to consider the resulting measurements in light of the statistical relationships they describe. In doing so, they tie up the doctor's subsequent treatment decision whether that treatment does, or does not, change in light of the inference he has drawn using the correlations."); *see also Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124, 136 (2006) (Breyer, J., dissenting from dismissal of writ of certiorari) (arguing that the patent claim for correlating metabolite levels with vitamin deficiency is invalid under Section 101 because the claim simply "instructs the user to (1) obtain test results and (2) think about them").

In the copyright context, the Court has made clear that the Constitution does not allow monopolization of facts or ideas, describing "the Copyright Act's distinction between copyrightable expression and uncopyrightable facts and ideas," as well as the fair use doctrine, as "First Amendment protections." *See Harper & Row*, 471 U.S. at 560. "No author may copyright his ideas or the facts he narrates." *Id.* at 556. This First Amendment prohibition should apply with equal force to patents. Just as copyright cannot become "an instrument to suppress facts," *id.* at 559, patents may not restrict thought or pure knowledge without running afoul of the Constitution. The Patent Act is a constitutionally valid exercise of congressional power, but that does not shield individual patents from constitutional scrutiny. *Cf. Harper & Row Publishers*, 471 U.S. at 556-60 (subjecting copyright to First Amendment analysis). The First Amendment thus provides a foundational reason why Section 101 must disqualify patents that preempt or restrict scientific thought. "Phenomena of nature, though just discovered, *mental processes*, and *abstract intellectual concepts* are not patentable, as they are the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67 (emphasis added). *See also Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012); *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130-31 (1948); Gary L. Francione, *Experimentation and the Marketplace Theory of the First Amendment*, 136 U. Pa. L. Rev. 417, 428 (1987).

When speech or thought is restricted based on its content, traditional First Amendment principles require that the government show that the restriction survives strict scrutiny – i.e., that the government has a compelling state interest and the restriction is narrowly tailored to achieve that interest. *Brown v. Entertainment Merchants Ass'n*, 131 S. Ct. 2729, 2738 (2011). There can be no compelling governmental interest in granting an exclusive license on knowledge, thought, abstract ideas, or every possible expression of those ideas. If, for example, the government decided to encourage innovation in mathematics by granting specific universities exclusive rights to use certain mathematical concepts, that exclusivity would be unconstitutional. Indeed, the First Amendment is based on the opposite premise – that progress is best achieved through a marketplace of ideas, not through a government-conferred monopoly over abstract ideas.

While the Copyright Act has addressed constitutional concerns within the statute through a number of doctrines, such as fair use, 17 U.S.C. §

107, the prohibition on issuing copyrights on facts or ideas, 17 U.S.C. § 102, and the distinction between ideas and expression, ***Harper & Row Publishers***, 471 U.S. at 556, patent law does not contain "built-in First Amendment accommodations," ***Eldred***, 537 U.S. at 219, to nearly the same extent. The law has recognized that music, art, and literature are excluded from the definition of patentable "useful arts," *see, e.g.*, Ex parte Lundgren, No. 2003-2088, 2004 WL 3561262, at *26 (B.P.A.I. Apr. 20, 2004) (per curiam), but these categories fall far short of addressing all thought and speech protected under the First Amendment. The Federal Circuit sharply narrowed the experimental use defense to patent infringement liability, so that university researchers engaged in projects that had "arguably no commercial application whatsoever" cannot invoke the defense if their research "furthers the institution's legitimate business objectives," including "educating and enlightening students and faculty participating in these projects," "increas[ing] the status of the institution," and "lur[ing] lucrative research grants, students and faculty." *Madey v. Duke Univ.*, 307 F.3d 1351, 1361-63 (Fed. Cir. 2002). The printed matter exception, which prohibits a patent where the only novel or nonobvious aspect of the subject matter is information contained in texts, speech, or diagrams, does not apply where the patent claims knowledge that exists within the human mind. *See* Kevin Emerson Collins, *Prometheus Labs., Mental Steps, and Printed Matter*, 50 Hous. L. Rev. 391, 421-29 (2012) (discussing how the printed matter exception would exclude a patent that claimed new instructions for the use of an already existing drug, but would not invalidate the patent at issue in *Mayo v. Prometheus*, which controlled the ability of a physician to mentally correlate metabolite levels with drug efficacy). Other patent law criteria, such as novelty and obviousness, do not directly address the thought and speech concerns that might arise with patents.

The prohibition on patenting abstract ideas under Section 101 is therefore the primary mechanism through which any constitutional concerns about monopolizing thought, ideas, and speech can be resolved. While the Section 101 exception to patent eligibility must not be interpreted over broadly so as to disallow almost any patent, *Mayo*, 132 S. Ct. at 1293, too narrow an interpretation – particularly where abstract ideas are implicated – would likely result in patents that infringe First Amendment rights.

II. ALICE'S CLAIMS PATENT KNOWLEDGE, THOUGHT, AND SPEECH IN VIOLATION OF THE CONSTITUTION.

A. The Patents Impermissibly Monopolize Knowledge, Thought, and Speech.

The patents in this case would be unconstitutional even if they are deemed permissible under Section 101. The method claims here would surely be invalid if performed by people using traditional, non-computer methods. That is because these patents directly claim abstract knowledge, thought, and speech – specifically, the economic practice of using a third party to guarantee exchanges, a form of escrow. Pet. App. 28a, 33a, 39a-40a. The claimed methods exclude others from using the economic practice of turning to a third party to guarantee exchanges. They encompass all software codes and all computers that can execute the method. They encompass use of this practice regardless of the type of transactions, obligations, parties, or exchange institutions involved. Pet. App. 218a-19a, 231a-32a.

In *Bilski*, the Court invalidated a number of patent claims covering a process for hedging risks of price changes in the commodities market. *Bilski*, 130 S. Ct. at 3218-3221. The Court held that the "concept of hedging" was "an unpatentable abstract idea." *Id.* Just as "hedging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class," *id.* at 3231, the concept of escrow is a fundamental economic practice that is properly considered "part of the storehouse of knowledge of all men." *Funk Bros.*, 333 U.S. at 130. *See also Le Roy v. Tatham*, 55 U.S. 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.").

The steps of Alice's method claim are also problematic because they are mental processes that a human can carry out. Humans think by means of algorithm, carrying out mental steps to reach conclusions. Allen Newell, ***Response: The Models Are Broken, The Models Are Broken***, 47 U. Pitt. L. Rev. 1023, 1025 (1986) (defining an algorithm as a "conditional sequence of steps or operations for solving a class of problems"). In *Benson* and *Flook*, the Court observed that the algorithm at issue in each could be performed by humans, using standard mental processes, even though the patents called for implementation by a computer. *Parker v. Flook*, 437 U.S. 584, 586 (1978) ("Although the computations can be made by pencil and paper calculations, the abstract of disclosure makes it clear that the formula is primarily useful for computerized calculations producing automatic adjustments in alarm settings."); *Benson*, 409 U.S. at 67 ("The mathematical procedures can be carried out in existing computers long in use, no new machinery being necessary. And as noted, they can also be performed without a computer.").[2] The concern raised in *Benson* and *Flook* applies to Alice's patents – the method of escrow set out by Alice could be reduced to an algorithm of mathematical operations that would occur as financial transactions are processed and could be carried out without resort to a computer. Upholding Alice's claims "in practical effect would be a patent on the algorithm itself." *Benson*, 409 U.S. at 72.[3]

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[2] In the early years of reviewing software patents, the Patent Office likewise took the position that a process could not be patented if it could be performed by a person in his or her head or with the aid of pencil and paper, even if the patentee intended to assert only the rights to computer implementation of the method. Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 Emory L.J. 1025, 1043-44 (1990).

[3] *Diamond v. Diehr*, 450 U.S. 175 (1981), did not present this issue. There, the Court upheld a method claim that incorporated computation of a mathematical formula into an industrial process of transforming uncured synthetic rubber, because the process required, at a minimum, the physical steps of operating a rubber-molding press. *Id.* at 179 n.5, 183.

Alice attempts to argue that its claims go beyond the concept of escrow by pointing to their implementation by a computer, the creation of shadow records, and the chronological adjustment of the accounts as the transactions occur. Pet. Br. 49-50. As the district court and a plurality of the Federal Circuit correctly held, these limitations are routine and conventional; the basis for the claim remains the concept of third party-intermediated escrow. Pet. App. 28a, 33a, 39a-40a, 214a, 230a. Alice did not invent the computer, nor did it invent using a third party to guarantee exchanges. Its method of addressing settlement risk is not limited to a particular software code or computer. Pet. App. 29a-30a, 39a. It is not limited to a particular kind of implementation – e.g., tailoring the method to situations where the exchange institution is a credit card company, debit card company, or a bank. Pet. App. 30a, 220a. In short, Alice's claim does not involve a "particular application" of the concept of escrow that qualifies as "inventive." *See Mayo*, 132 S. Ct. at 1299 (citing *Flook*, 437 U.S. at 594).

Moreover, the features Alice points to – the computer implementation, the creation of shadow records, and the chronological adjustment of balances – are similar to the features of the *Benson* claim that did not rescue it from invalidity. *Benson* involved a patent on a method for converting binary-coded decimal (BCD) numerals to pure binary numerals that had analogous features to those on which Alice relies. For example, the Court noted, "[t]he method sought to be patented varies the ordinary arithmetic steps a human would use by changing the order of the steps, changing the symbolism for writing the multiplier used in some steps, and by taking subtotals after each successive operation." *Benson*, 409 U.S. at 67. But because the method claim in *Benson* was so "abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion," the practical effect of the patent was to monopolize an idea. *Id.* at 68. Alice's patents likewise monopolize the concept of third party-intermediated escrow. Adding implementation by a computer, even where use of the computer is essential to the claim, cannot transform an unpatentable algorithm into patentable subject matter, *id.* at 71-72, and it does not change the First Amendment values at stake.

One could imagine the concepts of lending or the attorney-client relationship being described as methods in patents similar to Alice's patents. A patentee could seek exclusivity over a method of lending where the lender, using a computer, seeks collateral from the borrower and determines the monthly repayment, or a method of creating an attorney-client relationship that provides for a retainer agreement to be offered and returned via computer. But without more elaboration and specification, such patents would improperly seek to monopolize the abstract concepts and economic practices of lending and developing client relationships, without making any truly "inventive" contribution. They create barriers for others who want to think about and improve upon the basic concept.

Here, others cannot build upon the concept of third party-intermediated escrow patented by Alice. They face direct infringement liability if they come up with any new program or computer that uses a third party to guarantee exchanges, regardless of how closely associated it may be to actual software or hardware produced by Alice. Even if they chose not to actually create the code or computer, but simply to study the problem and publish a new code or computer design, they could be held liable for inducing infringement. *See* 35 U.S.C. § 271(b). Section 271(b) inducement extends liability to anyone "who advises, encourages, or otherwise induces others to engage in infringing conduct," *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 692 F.3d 1301, 1307 (Fed. Cir. 2012) (en banc) (per curiam), so long as the accused inducer acted with knowledge that the induced acts constitute patent infringement, *Global-Tech Appliances v. SEB S.A.*, 131 S. Ct. 2060, 2068 (2011). Thus, any entity that knowingly publishes or disseminates software code or hardware design with an explanation of how it might increase the efficiency or accuracy of third-party escrow accounts of the sort involved here could potentially be held liable for inducement, if it is determined that the publication instructed or encouraged individuals who subsequently infringe. *See* Dan L. Burk, *Patenting Speech*, 79 Tex. L. Rev. 99, 149 (2000); *cf. Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1365 (Fed. Cir. 2004) (holding that the publication of Continuing Medical Education articles and other pieces advising doctors about the correlation between elevated total homocysteine and cobalamin/folate deficiency could constitute inducement).

Because broad patents on economic practices or computer implementation of abstract ideas are difficult to avoid, they are often litigated, creating obstacles for innovation. *See* James Bessen &

Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators At Risk* 152 (2008) (concluding that financial patents are 27 times more likely and software patents are twice as likely to be litigated than other types of patents); *see also* Bronwyn H. Hall, *Business and Financial Method Patents, Innovation, and Policy* 13 (Nat'l Bureau of Econ. Research, Working Paper No. 14868, 2009), *available at* http://www.nber.org/papers/w14868.pdf?new_ window=1 (studies showed a 30% litigation rate for financial patents, compared to 1-2% rate for patents overall). One study found that litigation costs for business method and software patents amounted to billions of dollars and substantially exceeded profits from those patents between 1996 and 1999. *See* Bessen & Meurer, at 142-44. As a result, the patent system "likely provided a net disincentive for innovation for the firms who fund the lion's share of industrial [research and development]." *Id.* at 144.

Alice's patents create a content-based restriction that embraces abstract ideas and prevents others from devising their own software code or computer design to execute the method of third party-intermediated escrow or adding new features or steps to make the process more effective or efficient. The presumption against such content-based regulation under the First Amendment further bolsters the invalidation of Alice's patents under the Section 101 doctrine prohibiting patents on abstract ideas.

B. The Constitution Does Not Permit the Government to Grant Monopolies on Pure Knowledge, Thought, or Abstract Ideas, Regardless of Whether They Are Deemed "Truths" or "Disembodied Concepts."

Alice argues that only "fundamental truths" cannot be patented under Section 101, and attempts to distinguish these truths from "disembodied concepts," which it contends are patent-eligible. Pet. Br. 21-29. Alice explains that it views an abstract idea "as a preexisting, fundamental truth, *i.e.*, 'mathematical formulas and the like,'" *id.* at 23, and states that other "disembodied 'abstract ideas'" may be patent-eligible "because it cannot be said that each and every mental conception is a 'basic tool[] of scientific and technological work,'" *id.* at 27. Alice then focuses on the absence of a mathematical formula in its claims to argue that the claims do not monopolize fundamental truths.

Beyond the overarching First Amendment problem with granting monopolies on knowledge, thought, and ideas, discussed *supra*, Alice's position raises additional constitutional concerns. It empowers the government to decide whether a piece of pure knowledge qualifies as a patent-ineligible "truth," or is merely a disembodied mental concept or idea that can be monopolized through patent protection. The constitutional mandate that patents "promote the Progress of Science and useful Arts" is undermined if the government is authorized to determine upfront whether an abstract concept is a basic scientific or technological tool that can be monopolized. *See* U.S. Const., art. I, § 8, cl. 8; *see* *also Lab. Corp. of Am. Holdings*, 548 U.S. at 126-27 (Breyer, J., dissenting from dismissal of writ of certiorari) (noting "that sometimes *too much* patent protection can impede rather than 'promote the Progress of Science and useful Arts,' the constitutional objective of patent and copyright protection" (emphasis in original)); *Graham v. John Deere Co.*, 383 U.S. 1, 5 (1966) (noting that the Patent Clause "is both a grant of power and a limitation."). The Constitution instead requires that thought, ideas, and pure knowledge be protected from such regulation in order to give breathing space for scientific inquiry.

Alice's position also calls on the Court to place higher value on mathematical formulas or subject matter that is reducible to mathematical formulas over other abstract concepts when deciding what types of knowledge or thought is subject to patent protection. But the First Amendment does not permit monopolies on thought based on the government's judgment of their worth. *Cf. United States v. Stevens*, 559 U.S. 460, 470 (2010) ("The First Amendment's guarantee of free speech does not extend only to categories of speech that survive an ad hoc balancing of relative social costs and benefits."). In *Bilski*, although one of the challenged claims for hedging risk was reduced to a mathematical formula, others were not; they simply described methods for hedging risk, generally and in specific contexts. *Bilski*, 130 S. Ct. at 3223-24. If a patent claim had not described the method as a mathematical formula, would the method of hedging risk be a patent-eligible "disembodied concept" in Alice's view? The Court's reasoning did not turn on the depiction of the method as a formula. Instead, the Court warned that Section

101 cannot be sidestepped through draftsmanship. *See id.* at 3230-31. And it is difficult here to distinguish the method of hedging risk from the method of resolving settlement risk – the concept of a fundamental economic practice is at the heart of both sets of claims.

Furthermore, Alice's narrow definition of abstract ideas conflicts with the scientific method, which does not complacently anoint "truths," but instead requires those that engage in scientific inquiry to continue to test hypotheses against available evidence and refine their theories accordingly. Scientific propositions are always subject to testing, as new evidence may uncover a deeper or more accurate understanding. Under Alice's theory, however, a "disembodied concept" could be monopolized because it does not yet rise to the level of "truth," even when it is an abstract intellectual concept that can serve as the basis for further inquiry. The Court has often said that Einstein could not patent the theory of relativity. *Mayo*, 132 S. Ct. at 1293. But could he have patented the "disembodied concepts" he developed that ultimately led to $E = mc^2$? And how should the Court treat formulas that are superseded by more precise knowledge, as Newton's law of mechanics was by Einstein's theory of relativity?

The Court already has acknowledged that "[c]ourts and judges are not institutionally well suited to making the kinds of judgments needed to distinguish among different laws of nature." *Id.* at 1303. Contriving a new concept/truth distinction within the abstract ideas doctrine would only undermine the "bright-line prohibition" the Court has adopted in interpreting Section 101 to prohibit patents on building blocks. *Id.* Such an approach would inevitably lead to patents that impermissibly regulate thought and ideas based on content and interfere with scientific progress.

C. The Claims Cover Programming Code That Itself Deserves First Amendment Protection.

Alice's reliance on software implementation to prove patent eligibility only exacerbates the First Amendment problems inherent in allowing patents on abstract ideas, because the programming code used to create computer-readable software can also function as speech entitled to First Amendment protection. *See Universal Studios, Inc. v. Corley*, 273 F.3d 429, 445-46 (2d Cir. 2001); *Junger v. Daley*, 209 F.3d 481, 483 (6th Cir. 2000); *Bernstein v. Dep't of State*, 922 F. Supp. 1426, 1434-36 (N.D. Cal. 1996) [*Bernstein I*]; *see also Bernstein v. Dep't of Justice*, 176 F.3d 1132, 1140-41 (9th Cir.) [*Bernstein II*], *reh'g en banc granted and opinion withdrawn*, 192 F.3d 1308 (9th Cir. 1999). Where a patent excludes others from developing computer programming code related to a certain subject, the threat of patent liability threatens to chill much of the expressive communication among programmers about that subject. In other words, by patenting the computer implementation of an abstract concept, a private entity can use government protection to preempt all programming-related discussion about the patented topic. First Amendment concerns thus militate against allowing patent protection for abstract ideas – such as the escrow process – simply because they are implemented through software.

Programming code may serve both functional and expressive purposes.[4] *See Junger*, 209 F.3d at 484. On the one hand, programming code serves a functional purpose insofar as it is used to command the operation of a computer. *See Corley*, 273 F.3d at 448. On the other hand, programming code serves an expressive purpose insofar as it is used to communicate among individuals. "[P]rogrammers communicating ideas to one another," for example, "almost inevitably communicate in code, much as musicians use notes." *Id. See also Junger*, 209 F.3d at 484 ("[F]or individuals fluent in a computer programming language, source code is the most efficient and precise means by which to communicate ideas about cryptography."); *Bernstein II*, 176 F.3d at 1141. Although programming code is distinct from natural languages insofar as it can serve either functional or expressive purposes, the functional capacity of programming code does not negate its "simultaneously expressive nature" or otherwise "preclude constitutional protection." *Junger*, 209

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[4] Computer software comes in two forms: object code and source code (collectively, "programming code"). "Object code represents computer instructions as a sequence of binary digits (0s and 1s) that can be directly executed by a computer's microprocessor. Source code represents the same instructions in a specialized programming language, such as BASIC, C, or Java." *Junger*, 209 F.3d at 483. "Source code has the benefit of being much easier to read (by people) than object code, but as a general matter, it must be translated back to object code before it can be ready by a computer. This task is usually performed by a program called a compiler." *Corley*, 273 F.3d at 439. Although source code ordinarily cannot be executed on its own, some languages, such as PERL, can be executed by a computer without conversion to machine-readable code. Burk, *supra*, at 117 & n.111.

F.3d at 484. *See also Corley*, 273 F.3d at 447; *Bernstein II*, 176 F.3d at 1142.

Other features of programming code as a language, such as its relative obscurity to non-programmers and technical subject matter, do not alter the constitutional analysis. Although code may seem opaque to non-programmers, "the ease with which a work is comprehended is irrelevant to the constitutional inquiry." *Corley*, 273 F.3d at 446. *See also Hurley v. Irish-Am. Gay, Lesbian & Bisexual Grp.*, 515 U.S. 557, 569 (1995) (stating that the First Amendment "unquestionably" shields the "painting of Jackson Pollock, music of Arnold Schöenberg, or Jabberwocky verse of Lewis Carroll"). Nor does it matter that communications made in programming code often concern programming instructions or other forms of "dry information, devoid of advocacy, political relevance, or artistic expression." *Corley*, 273 F.3d at 446. As this Court has made clear, "the creation and dissemination of information are speech within the meaning of the First Amendment." *Sorrell v. IMS Health Inc.*, 131 S. Ct. 2653, 2667 (2011). *See also, e.g.*, *Rubin v. Coors Brewing Co.*, 514 U.S. 476, 481 (1995) ("information on beer labels" is speech). Because programming code is used to convey information among individual programmers, it qualifies as speech within the meaning of the First Amendment.

In the software context, patents on abstract ideas interfere with third parties' right to use programming code for expressive purposes because the mere publication or other dissemination of programming code within the patent's claims may expose the publisher to liability for patent infringement. Where a patent's claims cover an entire abstract concept, such as the concept of escrow, *all* programming-related speech on that concept at least potentially exposes the speaker to some form of infringement liability. In this case, for example, the printed publication of new programming code related to the process of escrow, together with an explanation of how that code might be implemented, could potentially expose the publisher to liability for inducing infringement of Alice's patents. *See supra* p. 19. In other cases, where the claimed invention extends only to functionally defined software (e.g., "program code configured to cause a computer to perform X function"), the publication of any related programming code, even in an academic journal, could also qualify as a form of *direct* infringement. *See Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1204-05 (Fed. Cir. 2010) (holding that the defendant's distribution of "locked" or disabled code as part of its product qualified as direct infringement of the plaintiff's software systems patent, because the plaintiff's "non-method claims describe capabilities without requiring that any software components be 'active' or 'enabled.'"); *see also Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 36 (1997) (holding that direct infringement does not require intent).

Nor would it be possible for academic journals, researchers, and other non-profit entities to claim immunity from infringement liability. Although the common law recognizes an "experimental use" defense to infringement liability, the defense, as currently construed, provides almost no safe harbor for individuals seeking to use programming code for expressive purposes. *Madey*, 307 F.3d at 1361-62 (to avail itself of the "very narrow" experimental use defense, the defendant must establish that its infringing actions were "for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry"). This narrow definition of the experimental use defense would provide no protection to technology-related periodicals, academic journals, research organizations, or any other entities that publish or disseminate programming code in connection with their legitimate business activities.

Given the potential for infringement liability to chill the expressive use of programming code, there is a significant risk that allowing private parties to monopolize abstract ideas will preempt not just innovation, but large amounts of programming-related speech. Indeed, in fields dependent on computer implementation – such as cryptography – allowing patents on abstract ideas could effectively preempt almost *all* speech on the patented topic.

D. Alice's Media and System Claims Give Rise to the Same Constitutional Concerns as the Method Claims.

Lastly, in this context, the media and system claims must be held invalid for the same reasons as the method claims. This Court has held that the Section 101 inquiry must focus on the eligibility of what is patented, not on the form that the claim takes. Abstract ideas, laws of nature, and products of nature are not patentable, based "on the more fundamental understanding that they are not the kind of 'discoveries' that the statute was enacted to protect." *Flook*, 437 U.S. at 593. Clever draftsmanship cannot rescue a claim that otherwise falls short of the Section 101 threshold. The Court's "cases warn us against interpreting patent statutes in ways that make patent eligibility 'depend simply on the draftman's art' without reference to the 'principles underlying the prohibition against patents for [natural laws].'" *Mayo*, 132 S. Ct. at 1294 (alteration in original) (quoting *Flook*, 437 U.S. at 593).

This principle is especially vital when constitutional values are at stake. It is irrelevant whether the government-granted monopoly on thought, knowledge, ideas, or speech takes the form of a patent claim on a method, machine, or article of manufacture. In the context of computer-related claims, this concern is particularly salient, as computer-related claims can be easily written as claims on methods, machines, or articles of manufacture. Samuelson, *supra*, at 1130-31 ("There is no fixed dividing line between computer programs and computers because anything that can be implemented in software can also be implemented in hardware."); Newell, *supra*, at 1026 ("[I]t is not possible to do anything in computer science without having it be almost immediately related to use, with only small efforts of the imagination.").

Here, there is no meaningful distinction between the method claims on the one hand, and the media and system claims on the other. The media and system claims recite the same basic elements as the method claims. Pet. App. 32a-36a. Alice's method, medium, and system claims cover all programming codes that could potentially carry out the process of escrow, regardless of whether the code is used for expressive purposes. Nor has Alice pointed to any characteristic of the media and system claims that would warrant treating those claims differently than the method claims. It may well be that other patents contain invalid computer-related method claims but valid media and system claims, where the latter are based on an inventive concept other than an abstract idea; that is not the case with Alice's patents.

CONCLUSION

For the reasons stated above, the judgment of the court of appeals should be affirmed.

Respectfully submitted,

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v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICUS CURIAE* THE AMERICAN INTELLECTUAL PROPERTY LAW ASSOCIATION IN SUPPORT OF NEITHER PARTY

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STATEMENT OF INTEREST

The American Intellectual Property Law Association ("AIPLA") is a voluntary bar association of approximately 15,000 members who are lawyers in both private and corporate practice, judges, patent agents, academics, law students and USPTO professionals. Our members practice in a wide and diverse spectrum of intellectual property fields, including patent, trademark, copyright, and unfair competition law, as well as other fields of law affecting intellectual property. They represent owners of intellectual property as well as those who seek to commercialize technology. Our members are involved in United States litigation on behalf of patent owners and accused infringers, and also prosecute applications before patent and trademark offices, giving AIPLA a unique and varied perspective on the issue of patent eligibility of computer-implemented inventions.[1]

AIPLA has no interest in any party to this litigation or stake in the outcome of this case, other than its interest in seeking a correct and consistent interpretation of the law affecting intellectual property.[2]

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[1] In accordance with Supreme Court Rule 37.6, AIPLA states that this brief was not authored, in whole or in part, by counsel to a party, and that no monetary contribution to the preparation or submission of this brief was made by any person or entity other than AIPLA or its counsel. After reasonable investigation, AIPLA believes that (i) no member of its Board or Amicus Committee who voted to file this brief, or any attorney in the law firm or corporation of such a member, represents a party to this litigation in this matter, (ii) no representative of any party to this litigation participated in the authorship of this brief, and (iii) no one other than AIPLA, or its members who authored this brief and their law firms or employers, made a monetary contribution to the preparation or submission of this brief.

SUMMARY OF ARGUMENT

This Court once again returns to the challenge of analyzing patent eligible subject matter under 35 U.S.C. § 101 and, in particular, to the longstanding judicial rule that abstract ideas, *per se*, are not eligible for patent protection and that applications of an abstract idea are eligible.

The Federal Circuit's *en banc* decision in this case reflects the unfortunate disarray of current jurisprudence on Section 101 of the Patent Statute. Patent jurisprudence seems recently to have fixated on simply characterizing many patented inventions as purely abstract ideas, without any clear means of distinguishing between patent-ineligible abstract idea and the patent-eligible application of that idea. Instead, the current undefined rubric of Section 101 gets repeatedly invoked to deny patent claims, many times because the claimed subject matter appears too broad, or too vague, or already invented.[3] In this way,

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[2] AIPLA sought and obtained consent to file this brief from the counsel of record for all parties, pursuant to Supreme Court Rule 37.3(a). Counsel for both parties filed general letters of consent with the Clerk.

[3] For instance, the children's "teeter totter" toy (at bottom, an application of the simple machine "lever") might have been patentable when first conceived because at that time it was a "new and useful . . . machine", and a specific application of an abstract physical law. Today, of course, a patent application for a teeter totter would and should be rejected. But the reason would not be because it is ineligible under Section 101 as an abstract

Section 101 too often has provided an easy, blunt tool to deny patent protection, where the possible grounds for finding the patent invalid (or unpatentability for an application) more prudently could be based on the prior art and the other key conditions of patentability set forth in Sections 102, 103 and 112 of the Patent Act.

As detailed below, this Court's prior decisions on computer-related patent eligible subject matter have focused appropriately on the particular facts of each case. Here, however, some will ask the Court to issue an across-the-board ban on computer-implemented inventions, with no consideration of whether a specific computer-implemented application of the underlying idea can ever constitute patentable subject matter. Whatever the merits of the particular patent claims before this Court, such a wholesale exclusion is completely inconsistent with the fact-based analysis which has guided this Court's precedent.

The Federal Circuit's *en banc* decision in this case provides more than enough evidence that this area of law is in disarray, to the extreme detriment of U.S. industries and technologies that rely on patent protection as a cornerstone of their investments in innovation. The competing views of the Federal Circuit judges, expressed

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idea, but rather because it lacks the necessary novelty required under the Act. Unfortunately, both the courts and the USPTO are rejecting countless patent applications and granted patents on the blunt basis that they are "abstract" rather than the admittedly sometimes more factually involved (but also more careful and tailored) comparison to prior inventions under novelty or obviousness review, or the fact that the claims are simply too vague or indefinite. 35 U.S.C. §§ 102, 103 and 112.

in their various opinions below, are telling about the difficulty that lower courts must face in applying current Section 101 precedent to the patent claims brought before them.

Section 101, as an enabling provision addressed to particular categories of inventive subject matter, typically is not the proper standard for deciding whether a particular technical advance is patentable as claimed. Applying it for that purpose has produced the same degree of uncertainty in the law that motivated Congress to establish the Federal Circuit more than 30 years ago; it has produced all of the dampening effects on innovation that motivated the Congress to confer on that court responsibility for uniformity in this area of the law.

As explained below, a careful examination of this Court's Section 101 case law reveals that the patent eligibility decisions there have turned on the specific facts of each case, including the detail of claim language, specifications, and prosecution history for the patents involved.

Moreover, these decisions explicitly reject any attempt to invoke categorical criteria for denying patent eligibility. They specifically disclaim any intent to preclude the patentability of software. They also specifically point out how the disclosures of some patent claims fall short for eligibility, and how other patent claims recite enough specifics to qualify. In one case, a vague and overbroad claim to a general calculation divorced from any specific application was found to be no more than a claim to an abstract idea,[4] whereas a claim that incorporated such a calculation into a particular industrial context was found to be a specific human application of the general concept.[5] The consistent theme of these and other decisions has involved the dividing line between patent ineligible attempts to capture bare ideas, divorced from specific human implementations, and patent eligible claims that involved a man-made application of those ideas.

The other crucial theme in this Court's case law is the preeminence of the patent claim language to define the invention entitled to exclusive rights. For purposes of Section 101, the corollary of that proposition is the consistent rule that the determination of patentable subject matter must be based on the claims as a whole, with due regard for the statutory category of the claimed invention.

This Court has made clear that determining whether a claim is directed to an abstract idea or to the application of an abstract idea must be tied to the actual claim language, taken as a whole and not dissected into constituent elements. And given the difference between apparatus and method claims, this Court should renew its recognition of the fundamental distinction between claim language directed to "a process" and claim language directed to "a machine." While there may be occasions where the line of demarcation is blurred by creative counsel, such occasions should not be allowed to obscure the basic principle that patent claims to machines are, by their nature, tied to particular physical structures, and are therefore in almost all cases statutory applications of ideas. By contrast, the patent eligibility of process or method claims may or may not be as clear, and may bear further scrutiny. These specifics should inform any decision on patent eligibility.

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[4] *Parker v. Flook*, 437 U.S. 584 (1972).

[5] *Diamond v. Diehr*, 450 U.S. 175 (1981).

This Court should return to these basic principles and hold that claims to computer hardware or software methods or systems are generally eligible for patent protection under Section 101 unless the specifics of the claimed invention indicate otherwise.

ARGUMENT

I. SECTION 101 CASE LAW OF PATENT ELIGIBILITY HAS CAST A CLOUD OF UNCERTAINTY OVER PROTECTIONS FOR INNOVATION

The question presented by the Petitioner asks "[w]hether claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court." Despite the strong disagreements among the Federal Circuit judges in this case, the high-level answer to the question presented is straightforward: under the decisions of this Court, claims to computer-implemented inventions *can be* directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101.

Subsumed within the question presented, however, are two critical issues on which the Federal Circuit unfortunately is deeply divided: (1) must a court peer through and beyond the specific claim language to discern a "genuine human contribution" in order to decide patent eligibility under Section 101; and (2) does the preeminence of patent claim language control the eligibility determination for all categories of invention listed in Section 101. However, this case has moved well beyond its facts and the actual claims under consideration. Some have moved the discussions from a consideration of patent eligibility for a particular invention to the suggestion of an across-the-board ban on computer implemented inventions, with no regard for whether the claimed invention is in fact an application of an underlying idea.

To be sure, as this Court has recognized, "[t]he line between a patentable 'process' and an unpatentable 'principle' is not always clear. Both are 'conception[s] of the mind, seen only by [their] effects when being executed or performed.'" *Parker v. Flook*, 437 U.S. 584, 589 (1978) (quoting *Tilghman v. Proctor*, 102 U.S. 707, 728 (1988)).

The difficulty of drawing that line, however, is not insurmountable. This Court grappled with a similar problem in *Feist Publications, Inc. v. Rural Telephone Service, Co., Inc.*, 499 U.S. 340 (1991), a case that discussed the "idea-expression" dichotomy in copyright law. Noting that "originality" is the *sine qua non* of copyright law, the *Feist* Court found that where a compilation author "clothes facts with an original collocation of word," the author could claim copyrightable expression based on that simple modicum of originality. *Feist*, 499 U.S. at 348. This distinction between unprotectable facts or ideas versus their protectable specific expression (as in copyright law) and unprotectable ideas or natural laws versus their protectable application (as in patent law), animates the very core of U.S. patent and copyright law.[6] These principles should also caution courts that such thresholds are rather low by design.

As this Court held in *Feist*, only minimal human creativity is required to transform unprotected fact into copyrightable human expression. *Id.* Similarly, this Court has previously made clear, and should once again confirm, that in the patent arena only a modicum of real-world application is required (in the computer context) to transform a patent-ineligible idea or principle into a specific, patent-eligible, man-made application of that idea, as reflected in the patent claim as a whole.

An inventor who transforms an algorithm into a computer program produces the means to cause the programmed computer or processor to operate differently as a machine. It is the production of this specific, real-world result—the different operation of the computer or processor—that is the man-made step which constitutes patent-eligible subject matter. If it turns out the "man-made step" is already known, then the patent claim certainly fails, but under Sections 102 and/or 103, and not because the claim as a whole merely embodies an abstract idea.

Unfortunately, after more than 30 years of jurisprudence, cases involving "algorithms" implemented on a computer have not provided certainty or predictability as to subject matter eligibility. Nowhere perhaps is this morass more starkly evident than in the Federal Circuit's *CLS Bank* decision, where the only agreement that the en banc court could muster was in a one-paragraph *per curiam* decision stating the result of the case, accompanied by seven different additional opinions. None of the authors of those opinions found a rationale to attract a majority, although each thought that he or she was correctly applying this Court's precedent.

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[6] This Court has on several occasions recognized that there can be parallels between patent and copyright law. *See eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 392 (2006); *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 442 (1984).

Judge Newman clearly stated her frustration at this, in the section of her dissent-in-part/concurrence-in-part entitled "*Today's Impasse*":

> The *en banc* court undertook to remedy disproportions flowing from inconsistent precedent on section 101. This remedial effort has failed. This failure undoubtedly reflects the difficulties of the question; I suggest that it also demonstrates that an all-purpose bright-line rule for the threshold portal of section 101 is as unavailable as it is unnecessary.

CLS Bank, 717 F.3d at 1321. Judge Newman continued, "Section 101 is not the appropriate vehicle for determining whether a particular technical advance is patentable; that determination is made in accordance with the rigorous legal criteria of patentability." *Id.*

As framed by the United States Constitution, patents are meant "to promote the Progress of ... the useful Arts." U.S. Const., art. I, § 8. These useful arts, *i.e.*, these *inventions*, can cover a vast array of useful methods and devices. No doubt the Founders never envisioned the vast array of inventions brought forth over the last 225 years, nor can we now envision what is yet to be invented in the future. For this reason, it is impossible to now absolutely define what would be, or should be, patent-eligible subject matter far into the future.

Congress grappled with this and other issues when it created the Federal Circuit, one of several outcomes from a broad study of litigation-related ills. *See, e.g.*, 67 F.R.D. 195 (1975) (Hruska Commission). The Senate Report leading to the Federal Circuit's creation stated that a single appeals court for patent issues would "increase doctrinal stability" and "produce desirable uniformity" in patent law. *See* S. Rep. No. 97-275, at 5 (1981), *reprinted in* 1982 U.S.C.C.A.N. 11, 15. In other words, it would produce certainty in patent law. As Professor Rochelle Dreyfuss expressed it, "a single [patent] appellate forum would create a stable, uniform law and would eliminate forum shopping. Greater certainty and predictability would foster technological growth and industrial innovation and would facilitate business planning." Rochelle Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U.L. Rev. 1, 5-7 (1989). Doctrinal stability was required, because in the late 1970s the law concerning patents was so unclear as to cause significant economic hardship throughout the United States. Professor Dreyfuss summarized the situation as follows: "It became impossible to adequately counsel technology developers or users. In such a legal environment, the promise of a patent could hardly be considered sufficient incentive to invest in research and development." *Id*, at 1.

At the time the new court was under consideration, now Circuit Judge Newman was Director of Intellectual Property Law for FMC Corporation. In her 2002 testimony before the Federal Trade Commission, Judge Newman recalled the situation as follows: "Investment in basic science, in applied research had disappeared.... Our production in the United States was no longer competitive. Old technologies were stagnant. New [technologies] were dormant." *See* Federal Trade Commission, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy 19 (2003).

Unfortunately, today's confused state of Section 101 jurisprudence threatens to bring back these same ills.[7] Whether discussing biotechnology or electronic/software advances, to quote Professor Dreyfuss, "it [is] impossible to adequately counsel technology developers or users." 64 N.Y.U. L. Rev. at 1. It is often simply impossible for lower courts and practitioners to understand what is and is not patent eligible subject matter based upon the current state of doctrine. This is a situation that this Court, AIPLA respectfully submits, should urgently put right.

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[7] The uncertainty resulting from these divisions has cast a pall over the United States software and information technology services industry, which the government valued at $606 billion in 2011 promoting domestic business opportunity to international businesses "because of its [the United States'] strong intellectual property rights laws and enforcement." *See* The Software and Information Technology Services Industry in the United States (2011), available at http://selectusa.commerce.gov/industry-snapshots/software-and-information-technology-services-industry-united-states.

One justification for the judicially excluded subject matter categories, particularly abstract ideas, has been to prevent patentees from overreaching with claims to basic truths, "free to all men and reserved exclusively to none." *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948). While Section 101 is needed for that purpose, this Court's jurisprudence is now being invoked in patent litigation reform debates to address all manner of overreaching by patent owners.

Broad claiming, poor claim drafting, or poor patent quality in general are all important issues to address, but Section 101 eligibility is the wrong medicine. Overreaching by patentees is policed in the examination of patent applications and in court review of issued patents for novelty, nonobviousness and sufficient disclosure. This Court needs to clarify that its Section 101 jurisprudence is not a cure for problems with the conditions of patentability, and may not be used to contract the traditional breadth of patent eligibility that is fundamental to the U.S. patent system.

The clearest statement, AIPLA respectfully submits, is one that tells courts and practitioners to apply *all* of the sections of Title 35, United States Code, in weeding out bad patents and unpatentable applications. Allow the other sections of Title 35 to do their jobs, but AIPLA respectfully submits that the standard for what subjects are patent eligible must remain a broad and simple one that encourages innovation, since no one can (or frankly should) anticipate its potential ambit. As Chief Justice Burger wrote in *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980), Congress intended the Section 101 description of patentable subject matter to "include anything under the sun *that is made by man.*" (emphasis added).

It is time for a return to the broad congressional intent reflected in *Chakrabarty*, and AIPLA urges that the Court indicate that the legislative history cited in *Chakrabarty* remains the correct formulation—if the subject matter of a patent claim is new and made by man, then it is patent eligible. Beyond that, it can be a patent only if it also complies with the other conditions of patentability in Title 35, including novelty (§ 102), nonobviousness (§ 103), and "a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is nearly connected, to make and use the same" (§ 112). *Chakrabarty*, 447 U.S. at 312.

II. COMPUTER-IMPLEMENTED INVENTIONS CAN BE PATENT-ELIGIBLE

A. The Court's Prior Decisions Confirm that Computer-Implemented Inventions Can be Patent-Eligible

This Court long ago identified three classes of claimed "invention" excluded from the categories of patentable subject matter now embodied in 35 U.S.C. § 101—that is: laws of nature, physical phenomena and abstract ideas. At bottom, these limited exceptions address subject matter that is not patentable because nothing "new" has been added by man. As with the present case (and indeed in many computer-implemented cases), lower courts have wrestled with this Court's framework that while an abstract idea is not patentable, the application of an abstract idea can be.[8] *See, e.g., O'Reilly v. Morse*, 15 How. 62, 113-116, 14 L.Ed. 601 (1854).

The simple answer to the question presented here is straightforward. Claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—*can be* directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court. Importantly, each of this Court's computer-related decisions emphasized that the case was being decided on the specific facts at hand. Such attention to detail would have been unnecessary if claims to computer-implemented inventions were not patentable as a matter of law.

Gottschalk v. Benson, 409 U.S. 63 (1972) was the Court's first patent case dealing specifically with a computer-related invention. It involved an invention related to the programmed conversion of numerical information in general-purpose digital computers and, in particular, to a method for converting binary-coded decimal numerals into pure binary numerals. The Court began from the general proposition that abstract ideas are not patentable "as they are the basic tools of scientific and technological work," *id.* at 67, but then decided the case based on the facts before it: "The question is whether *the method described and claimed* is a 'process' within the meaning of the Patent Act." *Id.* at 65 (emphasis added) (footnote omitted) (*citing* 35 U.S.C. §§ 100(b) and 101).

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[8] More specifically, the patent claims before the Court in this case include claims to a method, claims to data processing systems, and claims to computer-readable media containing a computer program. *CLS Bank Int'l. v. Alice Corp. Pty, Ltd.*, 717 F.3d 1269, 1274 (Fed. Cir. 2013)(*en banc*).

The Court found the claims ineligible under Section 101 because the only practical application of the mathematical formula involved was in connection with a digital computer, which meant that the patent "would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." *Id.* at 72. Significantly, the Court explicitly rejected any suggestion that it intended to preclude patent eligibility for software programs: "It is said that the decision precludes a patent for any program servicing a computer. *We do not so hold.*" *Id.* at 71. (Emphasis added.)

Flook involved patent claims to a method covering "*any use of a formula* for updating the value of an alarm limit on any process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons." *Id.* at 586 (emphasis added). In reaching its conclusion that the claimed invention was ineligible for patent protection, the Court was careful to note that the patent application did not specifically explain how the variables used in the formula were to be selected, and contained no disclosure relating to the chemical processes at work or the means of setting off an alarm. *Id.* At the same time, the Court explained that the claim step involving "conventional or obvious" "post-solution activity" could not transform the unpatentable principle into a patentable process, because doing so would "exalt[] form over substance."[9] *Id.* at 590.

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[9] It is noteworthy that the vagueness identified by the Court: lack of specificity of variables or the chemical process context, etc., encompass issues of claim indefiniteness typically resolved by 35 U.S.C. § 112.

Diehr was the next Supreme Court case to consider a patent claim to a method involving a programmed digital computer. Crucially, the *Diehr* case also involved an alarm limit (just like *Flook*), but set the alarm limit into a specific setting, with specific values and for a specific industrial purpose: molding rubber. *See* 450 U.S. at 210 n.31. The Court majority held that the recited "physical and chemical process for molding precision synthetic rubber products falls within the § 101 categories of possibly patentable subject matter." *Id.* This Court, engaged in a case-specific analysis, distinguished *Flook* on the ground that the patent application in *Flook*:

> did not purport to explain how these other variables [for an updated alarm] were to be determined, nor did it purport 'to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting the alarm limit. All that it [the *Flook* claim] provides is a formula for computing an updated alarm limit.'

Id. at 186-87 (*quoting* 437 U.S. at 586). By contrast, *Diehr* described the claimed process as drawn to a specific industrial process for the molding of rubber products, and thus patent-eligible under § 101. *See* 450 U.S. at 192-93.

In the course of its analysis, *Diehr* identified three important aspects of an analysis under § 101. First, claims must be considered as a whole. *Id.* at 188. Second, "[t]he 'novelty' of any element of steps in a process, or even of the process itself, *is of no relevance* in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Id.* at 188-89 (emphasis added). Third, case specific analysis of the details in the record of the specific patent is required to identify meaningful limits on the scope of the claim. *Id.* at 191-92.

Comparing the *Diehr* decision against the *Flook* decision, both helpfully involving a similar "idea"—the calculation of an alarm limit, underscores the relatively low threshold that Section 101 can and should provide to subject matter eligibility. On the one hand, *Flook* claimed a vague and overbroad general calculation, an abstract idea, divorced from specific contexts. On the other hand, *Diehr* took that same idea, an alarm limit, and claimed it meaningfully within a specific context, a specific human application of the general concept. The successful claims in *Diehr* (as opposed to the unsuccessful claims in *Flook* and the unsuccessful copyright owner in *Feist*) exhibit the relatively low bar that Section 101 should provide.

In the area of business processes, this Court also rejected any bright line approach for patentability. In *Bilski v. Kappos*, 130 S.Ct. 3218 (2010), the Court reviewed method claims directed towards buyers and sellers of energy commodities hedging against the risk of price changes in that market. The Court, rejecting "machine or transformation" as the sole test for Section 101 patent eligibility,[10] expressly warned against adoption of "categorical rules that might have wide-ranging and unforeseen impacts." *Id.* at 3230. After a record-specific analysis of "key claims" 1 and 4, directed to a general series of steps for hedging risk and a mathematical formula reflecting that concept, *id.* at 3223, the Court concluded that "[Bilski's] claims are not patentable processes because they are attempts to patent an abstract idea." *Id.* at 3230-31.

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[10] The USPTO repeatedly argued for the "machine or transformation" test as the bright-line rule for Section 101 patent-eligibility, but that categorical approach was finally and clearly rejected in *Bilski*.

Mayo Collaborative Services v. Prometheus Labs., Inc., 132 S.Ct. 1289 (2012), did not involve a computer-implemented invention, but is consistent in its fact-specific analysis. *Mayo* considered claims directed to methods of adjusting drug dosages to treat patients suffering from autoimmune diseases. The Court focused on the degree of detail in the record to determine "whether the claims do significantly more than simply describe those natural relations [between concentrations of metabolites and the effectiveness of a drug dosage]" and recite the steps of applying the natural law. *Id.* at 1297. That is, by holding the *Mayo* claims patent-ineligible, *Mayo* distinguished the details of claimed application of ideas in *Diehr* based on "the way the additional steps of the process integrated the equation into the process as a whole," and identified the details of that patent application which demonstrated the point. *Id.* at 1298-99.

In sum, the Court's decisions in *Benson*, *Flook*, *Diehr*, *Bilski* and *Mayo*, taken together, demonstrate the basic dividing line between patent-ineligible claims that simply attempt to capture bare ideas, divorced from specific human implementations (and which thereby might preempt broad swaths of future applications), and patent-eligible claims that situate such ideas in a specific context and human-made application. The fact that the Court engaged in such case-specific inquiries in *Benson*, *Flook*, and *Diehr*, demonstrates the basic point that computer-implemented inventions, *per se*, can be patent-eligible.

B. The Court Should Reiterate that Claims are to be Considered as a Whole, with Due Regard to the Statutory Category of the Invention Claimed

This Court has repeatedly required that a claim be considered as a whole, in a variety of contexts. It has done so in the course of assessing patent-eligibility under Section 101. *See, e.g.*, *Diehr*, 450 U.S. at 188 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole.") In *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 374 (1996), while holding that claim construction was an issue to be decided by the trial judge, the Court noted the significance of the patent claim in the context of an infringement suit. "Victory in an infringement suit requires a finding that the patent claim 'covers the alleged infringer's product or process.'" *Id.* The Court held in *Warner-Jenkinson Co. v. Hilton-Davis Chem. Co.*, 520 U.S. 17, 40 (1997), that all elements in a claim are relevant for analysis of infringement under the doctrine of equivalents. Thus, the Court should clarify that analysis of whether a process (or any) claim is to an abstract idea or to the application of that abstract idea must not be divorced from all of the actual claim language, taken as a whole.[11]

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[11] To take the child's "teeter totter" analogy again (*supra*, footnote 3), what many courts tend to do (and the various Federal Circuit opinions in this case are no exception) is to parse the

Second, this Court has long recognized the fundamental difference between a process and a machine (two different statutory categories of invention under § 101). *See, e.g., Expanded Metal Co. v. Bradford*, 214 U.S. 366, 384 (1909):

> A machine is a thing. A process is an act, or a mode of acting. The one is visible to the eye — an object of perpetual observation. The other is a conception of the mind, seen only by its effects when being executed or performed. Either may be the means of producing a useful result.

Id. (*quoting Tilghman v. Proctor*, 102 U.S. 707, 728 (1880)). At its core then, there is a fundamental difference between a process claim, which need not be tied to any specific structure, and a machine claim, which necessarily is grounded in structure.

This Court should emphasize that a claim to a computer system (a "machine") should generally pass muster under Section 101, since it has the facial attributes of a machine. Just like the child's teeter-totter, *see* note 3, *supra*, such claims should be more properly scrutinized under Sections 102, 103 and 112. Process or method claims, on the other hand, may bear more scrutiny, particularly if such claims do not themselves include specific components, chemicals,

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teeter totter into its parts. They would then state that the claimed apparatus is simply a lever and a fulcrum, throwing out the seats and handholds and any other physical attributes as simply add-ons (or in the case of computer claims, "mere post-solution activity") to reject the claim as an abstract idea. In fact, such a claim, taken as a whole, would be far from abstract and instead should, if filed today, simply be rejected as not novel or obvious.

machines, or other physical or real-world objects that they are acting upon.[12]

While creative counsel might sometimes blur the lines of demarcation in patent claims, it is essential to note that physical structure is a requirement of apparatus or articles of manufacture claims, but not necessarily of process or method claims. The Court should clarify that required physical structure in a claim to a non-process statutory invention must be given substantive consideration in analyzing whether a claim is to an abstract idea or to the application of that abstract idea.[13]

In 1994, the Federal Circuit held that a claim to circuitry elements in a general purpose computer that perform mathematical calculations was patent-eligible under § 101 because "such programming creates a new machine." *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994) (*en banc*). The Federal Circuit is divided over the continuing vitality of *Alappat*. *CLS Bank*, 717 F.3d at 1316. AIPLA urges the Court to emphasize that a claim to a general purpose computer to perform calculations does pass muster under Section 101 for the cogent reasons expressed in *Alappat.*

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[12] In other words, a method claim directed to process A operating on computer component X, or process B that uses computer component Y, etc., should also generally pass 101 muster, and certainly bears less scrutiny than a set of processes wholly divorced from any components or real-world objects whatsoever.

[13] In *Mayo*, the Court "decline[d] the Government's invitation to substitute §§ 102, 103 and 112 inquiries for the better established inquiry under § 101." 132 S. Ct. at 1304. AIPLA recommends that this Court make clear that trial courts are not obligated to assess patent claims under those provisions in strictly numerical order (i.e., a district court can screen claims, in its sole discretion, using any provision).

Indeed, confusion about these points jeopardizes the protection of some of the world's greatest current innovations. Just to take the example of the "smart phone", these machines are some of the most advanced, complicated, fast and powerful machines human beings have devised. It would be exceedingly odd if our patent laws, which ably covered all of the inventive history of this country from processes for manufacturing salt peter, to twisting new barbed wire, to sending messages through telegraphic alphabets, to color television transmissions, to new genetically modified bacteria, suddenly no longer protected any of the countless new applications being developed and implemented on these fantastic machines.

A new "app" on a smart phone may not be patentable because it simply incorporates obvious steps or desired outcomes in an obvious way, using conventional tools. But that is not a basis for Section 101 ineligibility. All apps on all smart phones use computer implemented instructions to transform a general purpose computer (the smart phone) into a new machine. Using particular apps, one's smart phone can become, at turns: a compass, a flashlight, an interactive map, a "yellow pages", a pedometer, a television, a videophone, etc. Each of these specific machines would of course be patentable in principle if it were hard-wired as a specific separate machine. It would be anomolous if such marvels were rendered *per se* ineligible for patent protection when combined in the smart phone with clever software to make them interchangeable with the push of a button. Yet that is exactly the state of affairs we face, with the tangled jurisprudence exemplified by *CLS Bank.* The tangle begs to be untied.

III. CLARITY IS WARRANTED TO PROVIDE DIRECTION TO OUR COUNTRY'S SOFTWARE AND INFORMATION TECHNOLOGY SERVICES INDUSTRY

Our country's software and software-related industries have grown over the past 50 years into critical financial and technology drivers of our economy. Businesses have invested substantial sums of money in research and development, keeping the United States at the forefront of new innovations. At the same time, there has been substantial growth in the number of issued United States patents. There should be little doubt that American businesses have invested substantial amounts of money in research and development of computer-related inventions and have sought to protect that investment, in significant part, with patents. The Court is urged to clarify the relevant law in view of the troubling divisions reflected in *CLS Bank*.

The United States government actively promotes our country's software and information technology services industry. *See, e.g.*, http://selectusa.commerce.gov.[14] The United States software and information technology services industry increased its revenue by an average of six percent between 2010 and 2011, totaling $606 billion in 2011. Research and development spending in the United States information and communications technology sectors increased from 2010 to 2011 by 6.3% to $126.3 billion. And as of 2011, there were more than 100,000 software and information technology services companies in the United States, with more than 99% being small and medium-sized firms (*i.e.*, under 500 employees). Indeed, "[i]nternational companies in the industry have shown a keen interest in the U.S. market because of its strong intellectual property rights laws and enforcement."[15]

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[14] *See* note 7, *supra*.

These "strong intellectual property rights laws" have included the availability of patent protection for software inventions. *See, e.g.*, Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry*, 83 Texas L. Rev. 961, 972 (2005) ("as it became increasingly clear that copyright protection was inadequate, supporters of patent protection in the [software] industry gained force, and many of the leading firms now have large numbers of patents.")

Unsurprisingly, it remains difficult to quantify the absolute number of issued United States "software" patents and/or the percentage of issued United States patents that are "software" patents, given the ubiquity and power of software and computer-implemented inventions that run throughout nearly all of modern-day technology. The studies that have been made yield varying, yet consistently large results. *See, e.g.*, Bronwyn H. Hall & Megan MacGarvie, *The Private Value of Software Patents*, Research Policy 39 (2010) *available at* http://bronwynhall.com (summarizing different definitions and studies at pp. 13-15). According to Professors Hall and MacGarvie, analysis based on a "keyword search" definition indicated that between 1996 and 2006, the number of issued United States software patents increased from approximately 10,000 to approximately 30,000.[16] *Id.* (Figure 1).

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[15] *Id.* Other data reflect comparable growth patterns. Investment in new and replacement software in the United States has increased from $85.5 billion in 1996 to $257.9 in 2011. Bureau of Econ. Analysis, Private Fixed Investment in Equipment & Software, at 2, 7, http://www.bea.gov/national/FA2004/E&S_type.pdf

Professors Hall and MacGarvie concluded that "[u] sing any of the definitions, there is substantial growth since 1976 that accelerates in around 1995-96." *Id.* at 15. *See also* John R. Allison & Mark A. Lemley, *Who's Patenting What? An Empirical Exploration of Patent Prosecution*, 58 Vanderbilt L. Rev. 2099 (2000) (reading the specification and claims of a sample of 1000 patents issued between 1996 and 1998 led to the conclusion that 10% of the issued patents during that time window were software patents.)

The substantial growth in the number of issued software patents parallels the substantial increase in investment and success of these important segments of our economy. Software and computer-implemented inventions power our modern economy in significant and pervasive ways. The fact an invention today can be developed in a hard-wired implementation or a soft-wired flexible way, through general purpose computers and software, should be largely irrelevant for determining whether such innovations are in principle patentable.

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16. To put this in context, in 1996, the USPTO issued 109,645 utility patents and in 2006 issued 173,772 utility patents. http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm.

CONCLUSION

In view of the foregoing, the American Intellectual Property Law Association respectfully requests that this Court make plain that claims to computer hardware or software methods or systems are generally patentable under 35 U.S.C. § 101 if drawn to a real-world application of the underlying idea(s); that Section 101 is intended to be a rather straightforward and low threshold; that the principle exception to 101 patentability is whether the claim, taken as a whole, simply restates a physical principle, law of nature or abstract idea; and that assuming a claim on its face does more than this, courts and the USPTO should follow the more prudent and careful approach and reject seemingly broad or obvious claims instead under Sections 102, 103 and 112 of the Patent Law.

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IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF THE ASSOCIATION OF THE BAR OF THE CITY OF NEW YORK AS *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY

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QUESTION PRESENTED

Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

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STATEMENT OF INTEREST OF *AMICUS CURIAE*

The Association of the Bar of the City of New York ("Association"), through its Committee on Patents, submits this amicus curiae brief in response to the Court's December 6, 2013 Order granting Alice Corporation Pty. Ltd. ("Alice Corp." or "Petitioner")'s petition for certiorari and setting forth the question presented above. The Association files this brief in accordance with Rule 37 of this Court, and supports the position of neither party.[1] The parties to the appeal have consented to the filing of amicus briefs. As such, consent and leave are not required.[2]

The Association is a private, non-profit organization of more than 24,000 members who are professionally involved in a broad range of law-related activities. Founded in 1870, the Association is one of the oldest bar associations in the United States. The Association seeks to promote reform in the law and to improve the administration of justice at the local, state, federal and international levels through its more than 150 standing and special committees. The Committee on Patents ("Committee") is a long-established standing committee of the Association, and its membership reflects a wide range of corporate, private practice and academic experience in patent law. The participating members of the Committee are dedicated to promoting the Association's objective of improving the administration of the patent laws.

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[1] With regard to the inquiries raised by Supreme Court Rule 37.6, no party's counsel authored this brief in whole or in part. No party or party's counsel or no person – other than the amicus curiae, its members, or its counsel – contributed money that was intended to fund the preparation or submission of this brief. Sup. Ct. R. 17.

[2] On December 13, 2013, the parties consented in writing to the filing of amicus curiae briefs.

SUMMARY OF ARGUMENT

"Laws of nature, natural phenomena, and abstract ideas" are generally considered to be the three judicially-created exceptions to the broad categories of patent-eligible subject matter set forth in 35 U.S.C. § 101. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981). Although these Section 101 exceptions have been a part of patent law for decades, there exists significant jurisprudential disagreement regarding the contours of the test for subject matter patent eligibility under Section 101. This disagreement is illustratively crystallized in the Federal Circuit's opinion below, wherein a short per curium opinion was followed by six divergent opinions that apply varied interpretations of the law of Section 101 patentability to the patent claims at issue.

The Federal Circuit's varied approaches to the determination of patent eligibility under Section 101 may be attributed to a misapplication of this Court's precedents in *Diehr* and *Mayo Collaborative Serv. v. Prometheus Lab., Inc.*, 132 S. Ct. 1289 (2012). *Diehr* teaches that in order to determine patent eligibility under Section 101, the "claims must be considered as a whole," and as such, "[i]t is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis." *Diehr*, 450 U.S. at 188. *Mayo* initially suggests that matter unpatentable on its own, such as a natural law, be disregarded whereupon the balance of the claim must contain an "inventive concept" or must "add enough" in order for the claim to be patent-eligible. *Mayo*, 132 S. Ct. at 1294, 1297. However, in *Mayo* this Court went on to analyze the claims as a whole, consistent with *Diehr*. *Id.* at 1298. In one opinion below and in additional post-*Mayo* decisions, the Federal Circuit's approach misinterpreted and misapplied *Mayo* in failing to consider a claim as a whole. *See CLS Bank Int'l v. Alice Corp. PTY Ltd.*, 717 F.3d 1269, 1282-83 (Fed. Cir. 2013) (Lourie, J., concurring); *see also Bancorp Serv. L.L.C. v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266, 1279 (Fed. Cir. 2012). This Court should clarify the law of Section 101 patentability by reaffirming the approach of both *Diehr* and *Mayo*, and focusing the inquiry on whether the claim as a whole is directed to or encompasses patentable subject matter under Section 101.

Moreover, the question of whether an invention is "routine, well-understood, or conventional" is not relevant to whether the invention fits within the categories of patent-eligible subject matter under Section 101; rather, such inquiries are characteristic of novelty and nonobviousness determinations under Sections 102 and 103. This Court's precedent, along with the language of Sections 101, 102, and 103 of the 1952 Patent Act, a reading of its legislative history, and commentary from its principal authors, confirms that Section 101 addresses only subject matter eligibility for a patent. As such, this Court should reaffirm that no examination of novelty, nonobviousness, nor any other requirement of patentability, is appropriate within a Section 101 analysis.

Additionally, lower courts appear to disagree as to whether a claim construction analysis is a prerequisite to a determination of patentability under Section 101.

In this regard, it must be noted that claim construction is considered a prerequisite to any invalidity analysis, with no limitation to only Sections 102, 103, and 112. *See Rockwell Int'l Corp. v. United States*, 147 F.3d 1358, 1362 (Fed. Cir. 1998). Similarly, claim construction is the first step of a patent infringement analysis under Section 271. *See Markman v. Westview Instruments*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). As such, because Section 101 is a condition for patentability, and because a court seeking to examine a patent claim as a whole in order to determine patentability under Section 101 must necessarily be first apprised of the scope of the claim at issue, this Court should require that claim construction be an antecedent, threshold consideration before a determination of patentability is reached on any ground, including Section 101.

ARGUMENT

I. In Determining Patent Eligibility Under Section 101, A Claim Must Be Considered As A Whole Without Excluding Any Claim Elements, Consistent With This Court's Precedent.

Section 101 of the Patent Act provides broad categories of patentable subject matter: "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101 (2006). This Court has recognized the broad expanse of these subject matter categories. *See Diamond v. Chakrabarty*, 447 U.S. 303, 308-09 (1980). There are three judicially-created exceptions to the categories of patentable subject matter: "laws of nature, natural phenomena, and abstract ideas." *Diehr*, 450 U.S. at 185.

The Federal Circuit's opinions below reflect inconsistent approaches to the analysis of whether a patent claims patent-eligible subject matter under Section 101, particularly when an "abstract idea" may be included in a patent claim. Specifically, these opinions differ concerning whether to evaluate compliance with Section 101 by examining a patent claim as a whole, or by considering a patent claim's individual elements. For example, Judge Lourie first identifies any unpatentable abstract concept and then determines whether the claim "contains additional substantive limitations that narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself." *CLS Bank*, 717 F.3d at 1282 (Lourie, J., concurring). In contrast, Judge Rader states that "[a] court must consider the asserted claim as a whole when assessing eligibility." *Id.* at 1298 (Rader, C.J., dissenting).

These contrasting Federal Circuit opinions purport to find support in *Mayo Collaborative Serv. v. Prometheus Lab., Inc.*, 132 S. Ct. 1289 (2012) and *Diamond v. Diehr*, 450 U.S. 175 (1981). Yet, as Judge Rader recognized, Judge Lourie's approach is inconsistent with this Court's precedent in both *Mayo* and *Diehr* and reflects a misapplication and overextension of *Mayo*. *CLS Bank*, 717 F.3d at 1303 n.5 (Rader, C.J., dissenting).

Diehr taught that in order to determine the eligibility of a claimed process for patent protection under Section 101, the "claims must be considered as a whole." *Diehr*, 450 U.S. at 188. As such, the *Diehr* Court stated:

> It is inappropriate to dissect the claims into old and new elements and then to ignore the

> presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.

Id. at 188. The *Diehr* approach, involving the analysis of the claim as a whole for patent eligibility, has been adopted and implemented by the Patent Office. *See* U.S.P.T.O. Manual of Patent Examining Procedure ("MPEP") § 2106(II) (8th ed., rev. 9).

In contrast, *Mayo* outlined an analytical procedure whereby a claimed process is first analyzed for whether it "focuses upon the use of a natural law" (i.e., one of the judicially created exceptions to Section 101), and if so, the inquiry then shifts to:

> Whether the claims do significantly more than simply describe these natural relations. To put the matter more precisely, do the patent claims add *enough* to their statements of the correlations to allow the processes they describe to qualify as patent eligible processes that *apply* natural laws?

Mayo, 132 S. Ct. at 1297 (emphasis in original).

On its face, the process of dissecting a claim into its constituent elements for the purpose of determining whether the added features qualify as applications of laws of nature, and then parsing them into prior art and inventive concept, appears to stand in direct contravention to the directive in *Diehr*. Moreover, basing a determination of patent ineligibility on whether the "additional steps" beyond the natural laws themselves constitute "conventional activity previously engaged in by researchers in the field," *Mayo*, 132 S. Ct. at 1294, 1298, may seem contrary to *Diehr*'s teaching that "a new combination of steps in a process may be patentable even though all the constituents of the combination were well known." *Diehr*, 450 U.S. at 188.

However, an analysis of this Court's decision in *Parker v. Flook*, 437 U.S. 584 (1978), is instructive in reconciling the seemingly divergent approaches of *Mayo* and *Diehr*. In *Flook*, this Court held that in order to conduct a patent eligibility analysis under § 101, the process should be "considered as if the principle or mathematical formula were well known." *Id.* at 592. This Court held the process at issue in *Flook* to be "unpatentable under § 101, not because it contains a mathematical algorithm as one component, but because once that algorithm is assumed to be within the prior art, the *application*, considered as a whole, contains no patentable invention." *Id.* at 594 (emphasis added). Thus, this Court opined that "[e]ven though a phenomenon of nature or mathematical formula may be well known, an inventive *application* of the principle may be patented." *Id.* (emphasis added).

The focus of this Court's inquiry in *Flook* was not on whether additional elements of a claim—once the abstract idea was removed from consideration—were conventional or inventive, but rather on whether the *application* of the mathematical formula at issue constituted a patentable invention. Thus, the approach was "not at all inconsistent with the view that a patent claim must be considered as a whole." *Flook*, 437 U.S. at 594; *see also Aro Mfg. Co., Inc. v. Convertible Top Replacement Co., Inc.*, 365 U.S. 336, 345 (1961) (recognizing that "there is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention in a combination patent."). This notion was confirmed by this Court in *Bilski v. Kappos*, wherein this Court stated: "'an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.'" *Bilski v. Kappos*, 130 S. Ct. 3218, 3230 (2010) (quoting *Diehr*, 450 U.S. at 187) (emphasis in original). In *Bilski*, this Court reiterated that "a process claim meets the requirements of § 101 when, 'considered as a whole,' it 'is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing).'" *Bilski*, 130 S. Ct. at 3258 (quoting *Diehr*, 450 U.S. at 192).

In fact, in *Mayo*, after dissecting the claims into (1) unpatentable subject matter such as laws of nature and (2) additional steps, this Court actually went on to hold the claims unpatentable, analyzing them as a whole and in harmony with *Diehr*:

> ...the claims inform a relevant audience about certain laws of nature; and any additional steps consist of well understood, routine, conventional activity already engaged in by the scientific community; and those steps, *when viewed as a whole*, add nothing significant beyond the sum of their parts taken separately.

Mayo, 132 S. Ct. at 1298 (emphasis added).

Furthermore, in 1981, the *Diehr* Court appears to have attempted to forestall any perceived doctrinal divergence by addressing the holding in *Flook*, stating in footnote as follows:

> It is argued that the procedure of dissecting a claim into old and new elements is mandated by our decision in *Flook* which noted that a mathematical algorithm must be assumed to be within the "'prior art.'" It is from this language that the petitioner premises his argument that if everything other than the algorithm is determined to be old in the art, then the claim cannot recite statutory subject matter. The fallacy in this argument is that *we did not hold in Flook that the mathematical algorithm could not be considered at all* when making the § 101 determination. To accept the analysis proffered by the petitioner would, if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious.

Diehr, 450 U.S. at 189, n. 12 (emphasis added).

However, the *Diehr* Court's warning appears to have gone unheeded, leading to the Federal Circuit's misapplications of the *Flook* and *Mayo* claim dissection approach. Thus, in the *Bancorp Services* case, a Federal Circuit panel misapplied *Mayo* in instructing that "[w]hen the insignificant computer-based limitations are set aside from those claims that contain such limitations, the question under § 101 reduces to an analysis of what additional features remain in the claims." *Bancorp*, 687 F.3d at 1279. As such, *Bancorp Services* held that the "additional features" were "a matter of mere mathematical computation" and that "without the computer limitations nothing remains in the claims but the abstract idea of managing a stable value protected life insurance policy." *Id.* at 1279-80.

Similarly, in the Federal Circuit's *en banc* decision in the instant case, Judge Lourie's concurring opinion appears to dissect the claims in apparent yet misconstrued reliance on *Mayo*, whereas Judge Rader's dissenting opinion utilizes the holistic *Diehr* approach and argues that Judge Lourie has misapplied *Mayo*. *See CLS Bank*, 717 F.3d at 1282, 1286-91, 1298, 1303 n.5, 1310-11.

Given the confusion created by the seemingly divergent approaches to the Section 101 analysis described above, this Court should seize this opportunity to clarify the law by reaffirming this Court's precedents, including both *Diehr* and *Mayo*, and should require an analysis of a patent claim as a whole when analyzing subject matter patent eligibility. As noted by *Diehr*, a novel and inventive process may well involve conventional components whose combination—through the invocation of a Section 101 exception—may be worthy of patent protection. Further, this Court should hold that where a claim implicates a Section 101 exception, the claim should not be dissected to disregard the subject matter falling within that exception by considering only the additional claim elements. Rather, drawing on the common thread running through this Court's Section 101 precedent, the inquiry should focus on whether the claim as a whole recites an *application* of otherwise unpatentable subject matter (e.g. an abstract idea or natural law) that is directed to or encompasses patentable subject matter under Section 101.

II. Section 101 Of The Patent Act Does Not Include Or Implicate Any Threshold Requirement That There Be An Analysis Of Novelty Or Nonobviousness.

A concurring opinion in the Federal Circuit's decision in this case states that Section 101 requires "a genuine human contribution to the claimed subject matter." *CLS Bank*, 717 F.3d at 1283 (Lourie, J., concurring). Further, "[l]imitations that represent a human contribution but are merely tangential, routine, well-understood, or conventional, or in practice fail to narrow the claim relative to the fundamental principle therein, cannot confer patent eligibility." *Id.*[3]

However, whether an invention is "routine, well-understood, or conventional" is not relevant to whether an invention fits within the categories of subject matter eligible for a patent ("process, machine, manufacture, or composition of matter"). Rather, such inquiries are classic questions of novelty and nonobviousness. *See Diehr*, 450 U.S. at 189-190 (1981); *see also In re Bergy*, 596 F.2d 952, 960 (CCPA 1979). The 1952 Patent Act simply does not include or implicate novelty and nonobviousness in Section 101, and stands in contrast to the patent statute in effect prior to passage of the 1952 Act, which included patentable subject matter and novelty in a single, all-encompassing provision:

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[3] Judge Lourie cited this Court's recent "inventive concept" language in *Mayo v. Prometheus*. *See CLS Bank*, 717 F.3d at 1282 (Lourie, J., concurring) (quoting *Mayo*, 132 S. Ct. at 1294). However, as Judge Rader stated in dissent: "Judge Lourie's opinion takes the reference to an "'inventive concept'" in *Prometheus* and imbues it with a life that is neither consistent with the Patent Act's description of Section 101 nor with the totality of Supreme Court precedent regarding the narrow exceptions thereto .... He, thus, injects an 'ingenuity' requirement into the abstract exception inquiry. It is inconceivable to us that the Supreme Court would choose to undo so much of what Congress tried to accomplish in the 1952 Patent Act, and to do so by the use of one phrase in one opinion." *CLS Bank*, 717 F.3d at 1303 n.5 (Rader, J., dissenting).

> Any person who has invented or discovered any *new and useful art, machine, manufacture, or composition of matter*, or any new and useful improvement thereof, *not known or used by others* in this country, and *not patented, or described in any printed publication* in this or any foreign country, before his invention or discovery thereof, and *not in public use or on sale* for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceedings had, obtain a patent therefor.

Compare Patent Act of 1870, 16 Stat. 198, recodified as R.S. 4886 (1874) with 35 U.S.C. § 101 (2006). The first emphasized portion delineates patentable subject matter, whereas the subsequent emphasized portions set forth standards of novelty.

The 1952 Patent Act expressly separated patentable subject matter and novelty into distinct provisions, i.e. Sections 101 and 102, as Congress stated at the time:

> The corresponding section of existing statute is split into two sections, section 101 relating to the subject matter for which patents may be obtained, and section 102 defining statutory novelty and stating other conditions for patentability.

H.R. REP. No. 82-1923, at 17 (1952) [hereinafter "H.R. Rep. No. 1923"].[4] The corresponding Senate report has identical language. S. REP. No. 82-1979, at 17 (1952) [hereinafter "S. Rep. No. 1979"]; *see also* P. J. Federico,[5] *Commentary on the New Patent Act*, reprinted in 75 J. PAT. & TRADEMARK OFF. SOC'Y 161, 176 (1993) ("In the new code, this section has been divided into two sections, section 101 relating to the subject matter for which a patent may be obtained, and section 102 which defines statutory novelty and states other conditions for patentability.").

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[4] The provision on obviousness was included in the 1952 Patent Act, also outside of Section 101, to codify then-existing law: "Section 103, for the first time in our statute, provides a condition which exists in the law and has existed for more than 100 years, but only by reason of decisions of the courts." H.R. Rep. No. 1923 at p. 7; S. Rep. No. 1979 at 6. , "There is no provision corresponding to the first sentence explicitly stated in the present statutes, but the refusal of patents by the Patent Office, and the holding of patents invalid by the courts, on the ground of lack of invention, or lack of patentable novelty has been followed since at least as early as 1850. This paragraph is added with the view that an explicit statement in the statute may have some stabilizing effect, and also to serve as a basis for the addition at a later time of some criteria which may be worked out." H.R. Rep. No. 1923 at p. 18; S. Rep. No. 1979 at p. 18.

[5] P.J. Federico was a chief patent examiner at the U.S. Patent Office, and wrote the first draft of the 1952 Patent Act and participated in revisions thereto. As a special consultant to the House subcommittee, he was principal author of House Report No. 1923, which is substantially the same as Senate Report No. 1979, both cited herein. *Paulik v. Rizkalla*, 760 F.2d 1270, 1277 (Fed. Cir. 1985) (Rich, J., concurring).

Hence, Sections 101 and 102 of the 1952 Patent Act provided – in separate sections:

> 101. Inventions Patentable. Whoever invents or discovers any *new and useful process,*[6] *machine, manufacture, or composition of matter*, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
>
> 102. Conditions for patentability; novelty and loss of right to patent. A person shall be entitled to a patent unless –
>
> (a) the invention was *known or used* by others in this country, or *patented or described in a printed publication* in this or a foreign country, before the invention thereof by the applicant for patent, or
>
> (b) the invention was *patented or described in a printed publication* in this or a foreign country or in *public use or on sale* in this country, more

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[6] "'Process' has been used [in the 1952 Patent Act in place of "art" in the prior statute] as the meaning is more readily grasped than 'art' as interpreted, and the definition in section 100(b) makes clear that 'process or method' is meant." H.R. Rep. No. 1923 at p. 17; S. Rep. No. 1979 at p. 17; *Diehr*, 450 U.S. at 182-183.

> than one year prior to the date of the application for patent in the United States, or ....

Patent Act of 1952, Pub. L. No. 593 (codified as amended at 35 U.S.C. §§ 101, 102 (2006)) (emphasis added).

Congress explained that Section 101 was meant to specify the kinds of new, useful inventions or discoveries for which patents may be obtained, subject to the additional provisions of Title 35:

> Referring first to section 101, this section specifies the type of material which can be the subject matter of a patent.
>
> ...
>
> Section 101 sets forth the subject matter that can be patented, 'subject to the conditions and requirements of this title.' The conditions under which a patent may be obtained follow, and section 102 covers the conditions relating to novelty.
>
> A person may have 'invented' a machine or a manufacture, which may include anything under the sun that is made by man, but it is not necessarily patentable under section 101 unless the conditions of the title are fulfilled.

H.R. Rep. No. 1923 at p. 6; S. Rep. No. 1979 at p. 5.

In contrast, Section 102 sets forth the conditions relating to novelty that had been previously included alongside the categories for patentable subject matter in the Patent Act of 1870:

> Section 102 in paragraphs (a), (b), and (c) repeats the conditions in the existing law relating to novelty.
>
> ...
>
> Section 102, in general, may be said to describe the statutory novelty required for patentability, and includes, in effect, an amplification and definition of "new" in section 101.

H.R. Rep. No. 1923 at p. 6-7; S. Rep. No. 1979 at p. 5-6.

This Court has considered – and rejected – the notion that novelty be considered under Section 101. Rather, citing the above-quoted legislative history, this Court has recognized that statutory subject matter (Section 101) and novelty (Section 102) are separate and distinct inquiries:

> It has been urged that novelty is an appropriate consideration under § 101. Presumably, this argument results from the language in § 101 referring to any 'new and useful' process, machine, etc. Section 101, however, is a general statement of the type of subject matter that is eligible for patent protection 'subject to the conditions and requirements of this title.' Specific conditions for patentability follow and § 102 covers in detail the conditions relating to novelty. The question therefore of whether a particular invention is novel is 'wholly apart

> from whether the invention falls into a category of statutory subject matter' .... The legislative history of the 1952 Patent Act is in accord with this reasoning.

Diehr, 450 U.S. at 189-190 (quoting *In re Bergy*, 596 F.2d at 961 (Rich, J.[7])).

And more recently, this Court has considered whether a Section 101 analysis should replace the requirement for an analysis under Section 102 or 103:

> Given the many moving parts at work in the Patent Act, there is a risk of merely confirming our preconceived notions of what should be patentable or of seeing common attributes that track 'the familiar issues of novelty and obviousness' that arise under other sections of the statute but are not relevant to § 101.

Bilski, 130 S. Ct. at 3238 (2010) (Stevens, J., concurring) (citing *Parker*, 437 U.S. at 588); *see also Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859, 868 (Fed. Cir. 2010) ("In refocusing the eligibility inquiry on the statute, the Supreme Court advised that [S]ection 101 eligibility should not become a substitute for a patentability analysis related to prior art, adequate disclosure, or the other conditions and requirements of Title 35.")

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[7] Judge Rich was one of the main drafters of the 1952 Patent Act. *Bilski* 130 S. Ct. at 3248 (Stevens, J., concurring). He also worked with P.J. Federico on several revisions to the draft bill that became the 1952 Patent Act. *Paulik*, 760 F.2d at 1277.

Judge Rich also explained that sections 101, 102, and 103 can be understood as three separate "doors" requiring "separate keys." *In re Bergy*, 596 F.2d at 960 (Rich, J.). Section 101 is the "first door which must be opened on the difficult path to patentability." *Id.* Specifically:

> [W]hen one has only compliance with § 101 to consider, the sole question, aside from utility,[8] is whether the invention falls into a named category, not whether it is *patentable.* Falling into a category does not involve considerations of novelty or nonobviousness and *only* those two considerations involve comparison with prior art or inquiry as to whether all or any part of the invention is or is not in, or assumed to be in, the prior art or the public domain. *Prior art is irrelevant to the determination of statutory subject matter under § 101.* An invention can be statutory subject matter and be 100% old, devoid of any utility or entirely obvious. This is our understanding of the statute ....

In re Bergy, 596 F.2d at 962-963 (Rich, J.) (emphasis in original)).

As such, the structure of Sections 101, 102, and 103 of the 1952 Patent Act, along with its legislative history and commentary from its principal authors, and this Court's prior precedents, all make clear that Section 101 addresses only subject matter eligibility for a patent. No examination of novelty, nonobviousness, nor any other requirement of patentability, is appropriate within the Section 101 analysis.

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[8] The "utility" requirement requires only that an invention be capable of providing some identifiable benefit. *See Brenner v. Manson*, 383 U.S. 519, 534 (1966); *see also Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1366 (Fed. Cir. 1999).

III. "Claim Construction" Should Be Required Before A Section 101 Analysis, Consistent With Other Inquiries In A Patent Case (e.g., 35 U.S.C. §§ 102 & 103 Invalidity, 35 U.S.C. § 271 Infringement).

In the instant case, the district court engaged in no formal claim construction before declaring the patent claims invalid, instead relying upon the parties' agreement that all claims required a computer including at least a processor and memory. *CLS Bank*, 717 F.3d at 1275 (Lourie, J., concurring). Yet in several of its concurring and dissenting opinions below, the Federal Circuit opined on the meaning of claim terms before conducting the Section 101 analysis, with no explanation for the meanings ascribed to the claim terms:

> Chief Judge Rader and Judge Moore construe the method claims as far broader than the system claims.... Judge Lourie also construes the method claims broadly, but unlike the Chief Judge and Judge Moore, imports the breadth he reads into them into the system and media claims as well.... None of these judges explains how the record supports the claim constructions in which they engage, however.

CLS Bank, 717 F.3d at 1329 (Linn, J. and O'Malley, J., dissenting).

None of these appellate-level "claim constructions," followed a traditional claim construction analysis such as contemplated in *Markman* and *Phillips*, *infra* p. 21. As there was no lower court claim construction on review, the Federal Circuit construed the claims in the first instance, inconsistent with its traditional role as a reviewing court:

> We assume our colleagues feel free to ignore the record – or, more appropriately, the lack thereof – in this case because claim construction is a question of law which this court reviews de novo.... Whether review is de novo or not, however, it still must be a 'review' – *it must be premised on a record below in which all relevant claim construction issues were vetted and in which the parties had an opportunity to proffer intrinsic and extrinsic evidence which would inform the claim construction process.* None of that occurred in this case. Instead, Alice's evidence and arguments were proffered and accepted by all as established fact. We are not persons of skill in the art and cannot open the record for proceedings that did not occur below. We are a reviewing court whose review must be predicated upon the record presented.

CLS Bank, 717 F.3d at 1331 (Linn, J, and O'Malley, J., dissenting) (emphasis added).

In fact, the paramount issue in resolving patent disputes and defining patent rights is the determination of the scope of patent claims. Clarity in claim scope is of the utmost importance because the claims set forth all to which the patentee is entitled while apprising the public of what is still open to them. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 730 (2002); *see also McClain v. Ortmayer*, 141 U.S. 419, 424 (1891); *see also SAP America v. Versata Development Group*, 107 U.S.P.Q.2d 1097 (P.T.A.B. 2013).

This Court has noted the importance of uniformity and certainty and has held that the construction of claim terms in a patent is a question of law reserved to the court and not the jury. *See generally Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996). The Federal Circuit has outlined a process for determining the scope of patent claims to include analysis of the claim terms in light of the claim language itself and in light of the patent specification with recourse if needed to other extrinsic evidence. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1316-17 (Fed. Cir. 2005) (*en banc*).

Claim construction is a required prerequisite before determining whether a patent is invalid under Sections 102, 103, and 112 (novelty, nonobviousness, enablement and written description). "The first step in any invalidity or infringement analysis is claim construction." *Rockwell Int'l Corp. v. United States*, 147 F.3d 1358, 1362 (Fed. Cir. 1998). The Federal Circuit has specified that a proper claim construction is necessary to a finding of invalidity based on any of Sections 102, 103, and 112. *See Vita-Mix Corp. v. Basic Holding, Inc.*, 581 F.3d 1317, 1332 (Fed. Cir. 2009) ("We find that Basic has raised a genuine issue of material fact with respect to the anticipation, obviousness, and lack of enablement sufficient to defeat Vita-Mix's motion for summary judgment of no invalidity. We therefore remand the validity issues to the district court for a decision on the merits with instructions to apply the proper claim construction.").

The first step in the patent infringement analysis under Section 271 is always claim construction as well. *See Markman*, 52 F.3d at 976 (*en banc*), *aff'd*, 517 U.S. 370 (1996) ("An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing. It is the first step, commonly known as claim construction or interpretation, that is at issue in this appeal.") (citing *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821 (Fed. Cir. 1992)).

As the required practice under so many other sections of the Patent Act, it stands to reason that only after establishing the meaning and scope of the claims through claim construction may courts reasonably determine whether the claims have met the statutory standards for patentability. This Court has affirmed that statutory subject matter under Section 101 is, in fact, a condition for patentability. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 12 (1966) (stating that the 1952 Patent Act "sets out the conditions of patentability in three sections" (citing 35 U.S.C. §§ 101, 102, and 103)).

Since Section 101 recites a condition of patentability, it follows that in order to test a claim for compliance with Section 101, a court should have already established the scope and meaning of the claim language itself, just as for patentability in view of prior art or in view of the enablement and written description requirements, and for infringement. On several occasions, the Federal Circuit has recognized that claim construction may be an important first step in a Section 101 analysis:

> [C]laim construction is not an inviolable prerequisite to a validity determination under § 101. We note, however, that it will ordinarily be desirable – and often necessary – to resolve claim construction disputes prior to a § 101 analysis, for the determination of patent eligibility requires a full understanding of the basic character of the claimed subject matter.

Bancorp, 687 F.3d at 1273-1274; *see also In re Bilski,* 545 F.3d 943, 951 (Fed. Cir. 2008) (*en banc*) ("Although claim construction, which we also review de novo, is an important first step in a § 101 analysis ... there is no claim construction dispute in this appeal.") (citing *State St. Bank & Trust Co. v. Signature Fin. Group,* 149 F.3d 1368, 1370 (Fed. Cir. 1998) (Rich, J.) (noting that whether a claim is invalid under Section 101 "is a matter of both claim construction and statutory construction")). To find otherwise and to conduct statutory subject matter analysis without claim construction would create an ill-informed and misguided analysis in which courts make presumptions about the "meaning" of claim terms without the benefit of a full claim construction analysis.[9]

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[9] Requiring claim construction as a preliminary threshold consideration would also conform to the current claim analysis used at the U.S. Patent and Trademark Office ("USPTO"). Under the USPTO's examination guidelines, patent examiners are required first to interpret the claims in patent applications to determine whether they define subject matter that falls within a category of potentially patentable (i.e., patent-eligible) inventions, whether a process, machine, manufacture, or composition of matter. *See* MPEP § 2106 (II) (8th ed., rev. 9). After interpreting the claim language, the examination process continues to test the patentability of the patent claims under Sections 102, 103, and 112.

Even in this case, one concurrence below noted that construing a claim before addressing Section 101 issues is "not required" but "may be especially helpful in this regard by facilitating a full understanding of what each claim entails." *CLS Bank*, 717 F.3d at 1282 (Lourie, J., concurring) (citing *Bancorp*, 687 F.3d at 1273-74).

As such, this Court should prescribe claim construction as a threshold inquiry, before applying the standards of patentability, to determine whether a claim as a whole recites an invention directed to patent-eligible subject matter under 35 U.S.C. § 101, consistent with the practice of requiring claim construction before a determination under 35 U.S.C. §§ 102, 103, and 112, and infringement under 35 U.S.C. § 271.

CONCLUSION

For the reasons set forth above, the Court should hold that: (1) the Section 101 patentability analysis should consider a patent claim as a whole consistent with *Diehr*; (2) analysis of "patentable subject matter" should not include considerations of novelty or nonobviousness; and (3) "claim construction" should be required prior to any Section 101 patentable subject matter inquiry.

Respectfully Submitted,

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AMICUS
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BRIEF

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IN THE
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ALICE CORPORATION PTY. LTD.,

Petitioner.

v.

CLS BANK INTERNATIONAL AND CLS SERVICES. LTD.,

Respondents.

On Writ of Certiorari
to the United States Court of Appeals
for the Federal Circuit

BRIEF FOR *AMICUS CURIAE* RONALD M. BENREY IN SUPPORT OF NEITHER PARTY

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QUESTION PRESENTED

Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court.

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INTEREST OF *AMICUS CURIAE*[1]

Gottschalk v. Benson, 409 U.S. 63 (1972), cited my book, *Understanding Digital Computers*, in support of the proposition:

> A digital computer, as distinguished from an analog computer, is that which operates on data expressed in digits, solving a problem by doing arithmetic as a person would do it by head and hand.

Benson, 409 U.S. at 65 n.3, citing R. Benrey, *Understanding Digital Computers* 4 (1964) (hereinafter *UDC*).[2] This principle was argued by the Solicitor General, based on a partial quotation taken out of context from *UDC*:

> A digital computer solves a problem by actually doing arithmetic in much the same way a person would by hand.

Brief of Solicitor General, *Gottschalk v. Benson*, 1972 WL 137527 *4 (U.S.) (hereinafter "Solicitor General Brief") (citing Benray [*sic*], *Understanding*

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[1] In compliance with Rule 37, counsel for both parties have deposited with the Clerk of this Court general consent to the filing of *amicus* briefs. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amicus curiae*, its members, or its counsel made a monetary contribution to its preparation or submission.

[2] A copy of *UDC* has been deposited with the Supreme Court for future reference.

Digital Computers 4 (1964)) (hereinafter "the Benrey Quote").

I learned of the Court's mention of *UDC* in 1981 and was honored to see my words cited in a Supreme Court opinion. However, I was concerned that the quoted passage had been taken out of context, in support of an incorrect explanation of how computers operated. The quoted text was not meant to factually describe the inner workings of a digital computer, but rather as an easy-to-grasp analogy that would help lay readers understand the difference between digital and analog computers.

The portion of the *Benson* opinion based upon the Benrey Quote has been adopted by many courts as controlling legal principle, and unfortunately it has worked to extend the doctrine of mental steps to computer-implemented inventions.[3]

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[3] *Parker v. Flook*, 437 U.S. 584 (1978); *Bilski v. Kappos*. 130 S. Ct. 3218 (2010); *In re Sarkar*, 588 F.2d 1330 (C.C.P.A. 1978); *In re De Castelet*. 562 F.2d 1236 (C.C.P.A. 1977); *In re Comiskey*, 554 F.3d 967 (Fed. Cir. 2009); *In re Waldbaum*, 559 F.2d 611 (C.C.P.A. 1977); *In re Christensen*, 478 F.2d 1392 (C.C.P.A. 1973); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011); *Ultramercial, Inc. v. Hulu. LLC*, 722 F.3d 1335 (Fed. Cir. 2013); *DealerTrack, Inc. v. Huber*, 674 F.3d 1315 (Fed. Cir. 2012); *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Can.*, 771 F. Supp. 2d 1054 (E.D. Mo. 2011), aff'd, *Bancorp Servs.. L.L.C. v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266. (Fed. Cir. 2012); *Digitech Info. Sys. v. Bmw Fin. Servs. Na. LLC*, 864 F. Supp. 2d 1289 (M.D. Fla. 2012); *Perfect Web Techs.. Inc. v. Infousa. Inc.*, 89 U.S.P.Q.2d (BNA) 2001 (S.D. Fla. Oct. 24, 2008); *Prometheus Labs. v. Mayo Collaborative Servs.*, 86 U.S.P.Q.2d (BNA) 1705 (S.D. Cal. Mar. 28, 2008);

(Footnote Continued)

Since the answer to the question presented necessarily requires an understanding of how computers operate, the Court is likely to revisit its prior cases, including *Benson*. As such, it is important that the Court appreciate the problems inherent in the premise that computers perform mental steps, as argued by the Solicitor General and adopted by the *Benson* Court. Thus, I submit this brief as *amicus curiae* in the hope of restoring the correct context and meaning to the Benrey Quote.

I will also address the implications that a proper understanding of digital computers has on the framework of patent eligibility that arose in light of *Benson*. I provide an analysis of Benson's invention in view of the Court's conclusion that it was not patent eligible, and whether that conclusion is consistent with a proper understanding of digital computers. Finally, I explore the historical basis of the mental steps doctrine as it has been applied to computers and whether the application of the doc-

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Prometheus Labs., Inc. v. Mayo Collaborative Servs., 581 F.3d 1336 (Fed. Cir. 2009); *SmartGene, Inc. v. Advanced Biological Labs., SA*, 852 F. Supp. 2d 42 (D.D.C. 2012) aff'd *Smartgene, Inc. v. Advanced Biological Labs.*, No. 13-1186 (Fed. Cir. Jan. 24, 2013); *CLS Bank Int'l v. Alice Corp. Pty, Ltd.*, 768 F. Supp. 2d 221 (D.D.C. 2011); *Big Baboon, Inc. v. Dell, Inc.*, 2011 U.S. Dist. LEXIS 155536 (C.D. Cal. Feb. 8, 2011); *Compression Tech. Solutions LLC v. EMC Corp.*, 2013 U.S. Dist. LEXIS 78338 (N.D. Cal. May 29, 2013); *Digitech Image Techs., LLC v. Konica Minolta Holdings, Inc.*, 2013 U.S. Dist. LEXIS 108010 (C.D. Cal. July 31, 2013); *Fuzzysharp Techs. Inc. v. Intel Corp.*, 2013 U.S. Dist. LEXIS 160897 (N.D. Cal. Nov. 6, 2013); *Lumen View Tech. LLC v. Findthebest.com, Inc.*, 2013 U.S. Dist. LEXIS 166852 (S.D.N.Y. Nov. 22, 2013).

trine is appropriate in view of the scientific bases of computers.

INTRODUCTION

I am a graduate of the Massachusetts Institute of Technology with a degree in electrical engineering. In late 1961, on the basis of my education and prior writing experience, I was commissioned by John R. Rider Publisher, Inc. to write an introductory guide to digital computers aimed at electronic hobbyists—non-technically-trained readers who enjoyed building the electronic projects such as described in *Electronics Illustrated* and other special-interest magazines of the day.

At the time, computers were not the commonplace necessities they are today; instead, most people only knew about computers from what they saw in science fiction movies—great, room-sized machines with panels of blinking lights, whirling tape reels, and stacks of punch cards being fed into the maw of the machine.

My editor and I both understood the growing importance of digital computers during the 1960s as useful tools in research laboratories, government facilities, and large corporations. We also believed that computers would soon serve smaller businesses and eventually individuals as well. Consequently, we decided to demystify computer operation for a broad audience of potential readers. We planned a book in which I would craft explanations that could be readily understood by lay individuals.

Understanding Digital Computers was published in 1964. As I stated in the preface, the book was written to "bridge the wide gap that exists between complete digital computer textbooks and elementary picture books." Accordingly, I provided a background and introduction to the history of computer devices, an overview of their operation and usages, and then detailed, yet easy-to-understand, explanations of how contemporary digital computers were designed. I included many technical illustrations of various logic circuits that are the necessary foundation by which all computers operate. I further explained how computers execute computer programs and how the computer programs control the operations of the logic circuits, essentially electronic switches.

The Solicitor General relied upon the Benrey Quote to argue that a computer performs essentially mental steps when performing calculations, and therefore that Benson's invention was ineligible for patent protection.

While the Solicitor General acknowledged that "the computer operates by physical equivalents of logical functions," the Solicitor General nonetheless maintained that "the functions themselves are the *same procedures* which a human being would perform in working the same computation, but reduced to the physical characteristics of the device." Solicitor General Brief, 1972 WL 137527, at *7 (emphasis added). The argument became the basis on which the Supreme Court extended the mental steps doctrine to computer-implemented inventions.

SUMMARY OF ARGUMENT

Gottschalk v. Benson set forth as a legal principle that a general purpose computer operating under program control to execute a given calculation performs essentially the same mental steps that a human would. The foundation for this principle is based at least in part on the Benrey Quote, which was taken out of context by the Solicitor General in its brief to the Supreme Court in *Benson*. The Court, on the authority of the Solicitor General, adopted the quote as a factual predicate informing its legal analysis of patent eligibility. While the Court did not directly rely on the Benrey Quote for its ultimate holding, the legal principle the Court set forth continues to be cited as controlling in many patents cases, and often results in claims on computer-implemented inventions being held invalid under § 101.

The Solicitor General Brief argued that Benson's claim was unpatentable because it covered merely the mental steps for a mathematical procedure, even though it recited specific computer operations by specific computer hardware. The argument was based on three premises: (1) that computers perform mental steps; (2) that Benson's claimed invention was a purely mathematical solution derived from axioms of mathematics; and (3) that all mathematical algorithms are scientific truths. These three premises are incorrect.

To support the first premise, that computers perform mental steps, the Solicitor General Brief took the Benrey Quote out of context. In reality, the quote was made in the context of an explanation of what the word *digital* meant, to explain that computers operate on digits, like other devices such as adding machines and abacuses. The reference to how humans perform arithmetic was simply made as a helpful analogy to aid the reader, not as a technical statement about the nature of the human mind or the specific operation of computers. I made clear in a number of places in *UDC* that computers do not "think" like people do but instead achieve their power from relatively simple operations performed repeatedly and at high speed. Computers do not perform calculations, even simple ones, using the "same procedures" as humans do, as argued by the Solicitor General. The first premise of the Solicitor General's argument is therefore incorrect.

Second, Benson's invention was *not* the algorithm for the conversion of binary-coded decimal to binary, as argued by the Solicitor General and as believed by the *Benson* Court. Benson clearly stated in his file history that the BCD-binary conversion algorithm was known and that his invention was a specific way of performing the algorithm using a fewer number of operations and digital logic elements than known in the art. Thus, the second premise of the Solicitor General's argument was incorrect.

Third, mathematical algorithms are not scientific truths *per se*. Laws of nature and scientific truths, such as Einstein's theory of special relativity, can be *expressed* by mathematical formulas such as $E=mc^2$, but that does not make all mathematical expressions scientific truths. Mathematics is a precise and formal language for describing quantitative aspects of the world. Most mathematical algorithms and formulas are for decidedly non-scientific problems, such as fuel-efficient aircraft approach procedures (U.S. Patent No. 8,442,707), compressing video for transmission on cell phones (U.S. Patent No 8,494,051), efficiently allocating farming resources (U.S. Patent No. 6,990,459), or calculating golf handicaps and the difficulty of golf courses (U.S. Patent No. 8,282,455). Mathematical expressions used in applications like these are not like laws of nature or scientific truths at all. The third premise of the Solicitor General's argument was incorrect.

The decision in *Benson* led to the widespread application of the mental steps doctrine to computer-implemented inventions. Historically, the mental steps doctrine was limited to claims that specifically recited or required the exercise of human judgment or faculties. Only with the premise that computers performed essentially mental steps was the expansion of the doctrine possible, and it has led to the incorrect view that certain mental processes, particularly those that involve computation, are interchangeable with digital computation.

The mental steps doctrine does not properly apply to computers. First, prior to digital computers there were many mechanical devices that performed mathematical calculations, and it would not be suggested that the operations on such machines would be ineligible for patenting. This is because in such machines the mechanical components (e.g., gears, rotors, dials, shafts, switches, cams, etc.) were the loci of the computation. However, the overall *sequence* of operations themselves would not have been patent eligible if they would have required the judgment or thinking of the human operator to control the machine. This was typically true prior to the invention of the programmable computer, and so early cases addressing patent claims to mathematical formulas were correct in their outcomes.

However, with the advent of the programmable computer, the control of the overall sequence of steps in a calculation became mechanized, for example by a computer program. Just as mechanization of the underlying calculation steps in an adding machine precludes them from being mental steps, so too does the mechanization of the overall control by a computer program—which essentially controls electrical switches inside the computer—preclude the operations from being mental steps. In both cases, this results in patent eligibility.

Further, the use of a general purpose computer to perform a calculation is not evidence that the claim is merely a mental process. Section 100(b) expressly states that patent eligible subject matter under § 101 includes processes performed using known machines, which thus includes conventional general purpose computers.

Finally, the fundamental tenets of computer science dictate that a general purpose computer executing a computer program to perform a calculation is the equivalent of a special purpose, hardwired computer performing the same calculation. Scientifically, these are the same, and thus should not be treated differently for purposes of patent eligibility.

Accordingly, inventions implemented by computers, including software executing on a general purpose computer, are statutory subject matter under § 101.

ARGUMENT

I. THE SOLICITOR GENERAL'S ARGUMENT IN *GOTTSCHALK* v. *BENSON* THAT PROGRAMMABLE DIGITAL COMPUTERS PERFORM MENTAL STEPS WAS BASED ON THREE INCORRECT PREMISES

In *Gottschalk v. Benson*, the Court ruled that Benson's algorithm was a mathematical procedure and that all mathematical algorithms were like scientific truths. The Court's discussion of the *Benson* decision in *Parker v. Flook* further confirms this analysis: "Reasoning that an algorithm, or mathematical formula, is like a law of nature, *Benson* applied the established rule that a law of nature cannot be the subject of a patent." *Parker v. Flook*, 437 U.S. 584, 589 (1978).

The source of this argument was primarily the Solicitor General Brief to the Court in *Benson* opposing Benson's patent application. The Solicitor General's main argument was that Benson's claimed process was "unpatentable because it is no more than a set of mental steps for carrying out mathematical procedures." Solicitor General Brief, 1972 WL 137527, at *18-31. This argument was based on three key premises: (1) that mathematical procedures carried out by a computer are nothing more than mental steps; (2) that Benson's claimed invention was nothing more than the pure mathematical procedure for converting binary-coded decimal to binary; and (3) that all mathematical procedures are themselves scientific truths. Only if these premises were true would it then follow that Benson's algorithm as claimed was purely mental steps. However, all three premises are false.

A. *Understanding Digital Computers* Did Not Assert That Computers Perform Mental Steps Like Humans

In 1964, "advances in electronic digital computer technology [had] made possible many spectacular scientific achievements that would have seemed like 'science fiction' three or four decades ago," and computers were "generally pictured as incredibly complex electronic machines, aglow with flashing lights." *UDC* at 2. My goal was to demystify computers and clearly explain that they "owe many of their capabilities to their inherent simplicity." *UDC* at 3. To provide a context for explaining digital computers, *UDC* begins with a short overview of the history of "computers" as devices that manipulate numbers, such as the abacus, the mechanical adding machine developed in the 1600s by Pascal and Leibniz, and the first automatic mechanical computer designed by Charles Babbage in 1812. *UDC* at 2.

A "digital computer," *UDC* next explains, "is a device that can perform arithmetic operations and make simple *logical decisions* according to *instructions* it has been given. The arithmetic operations include addition, subtraction, multiplication, and division. A typical logical decision might be to compare the size of two numbers, and indicate which of the two is larger." *UDC* at 3 (emphasis in original). *UDC* subsequently explains that "every digital computer is made up of five *functional units* that work together in close harmony: the Input section; the Output section; the Arithmetic section; the Control section; and the Memory section." *UDC* at 9 (emphasis in original). "The *arithmetic section* is the actual calculating mechanism which performs the arithmetic operations called for by the instructions. The arithmetic section is the functional core of a digital computer; the four other sections oversee its operation and control the flow of the problem numbers into it and results out of it." *Id.* (emphasis in original).

In the early 1960s, the concept of something being digital was foreign to most people. Moreover, my editor and I believed that many of the book's potential readers were familiar with analog computers, which had been in use for many years. Thus, before delving into the details of the structure of digital computers, I included a brief comparison of analog and digital computers. This included a short section labeled *What does "digital" mean?* This is the section from which the Solicitor General selectively quoted, and thus it is reproduced here in its entirety; the Benrey Quote is shown in italics:

> The "digital" in digital computer tells us a lot about how these devices calculate. As we have said, input numbers are fed into a digital computer and output numbers are taken out. But what happens inside?

> "Digital" describes any calculating mechanism that represents quantity with integers as it calculates. Another way of saying the same thing is that *a digital computer solves a problem by actually doing arithmetic. in much the same way a person would "by hand."*
>
> If you were to look inside a digital computer as it is performing a calculation (we will in later chapters) you would see different numbers represented by the mechanism at various times: At the start of the problem, the input numbers would be "visible." Then, as the calculation goes on, "intermediate" results would appear. Finally, the answer would pop into view, just before it is sent out through the output. In effect, the computer is "writing the numbers down" as it does the arithmetic.
>
> Notice that "digital" can be used to describe any calculating device that represents quantity in this fashion. Desk calculators, cash registers, abacuses and most mechanical counters, such as odometers, meet this requirement. These devices are actually mechanical digital computers. The abacus represents numbers with wooden beads, the others use gears or notched wheels.

UDC, at 4-5. (emphasis added).

As is clear from the entire context of this section, my goal was to explain that *digital* computers operate on *digits*—representations of discrete numbers. Moreover, as a full reading of the third paragraph makes clear, I used a simple analogy—arithmetic done with pencil and paper—to help lay readers understand this foundational concept. Obviously one cannot "look inside" a computer to "see" actual numbers "pop into view"—this is simply a useful metaphor—nor does the computer "write down" anything on paper.

My book was published two years before the first handheld calculators became available—a time when most people performed simple arithmetic using pencil and paper. I note this to point out that my pencil-and-paper analogy would have been instantly understood by every reader. That made it an effective and obvious figure of speech to help readers grasp an essential difference between analog and digital computers.

The focus of my explanation was merely on the use of digits by digital computers to perform arithmetic. I drove the point home by providing additional examples to illustrate the concept. I stated that many types of calculating devices familiar to 1960s readers can be considered digital: desk calculators, cash registers, abacuses, and even odometers in automobiles. Later on, I returned to the idea that devices that manipulate numbers can be considered digital, writing, "We learned in Chapter 1 that digital mechanisms actually represent within themselves, the numbers being manipulated. Pascal's adding machine, for example, represented the numbers with notched wheels. Each wheel had ten notches—one notch for each decimal digit." *UDC* at 28.

Thus, it is clear that the context of the Benrey Quote was as part of a larger discussion that provided my readers with a way of relating the meaning of digital to something they were familiar with—doing arithmetic. It was not intended as a statement of fact that computers operate like human brains, and such an assertion is plainly false.

Moreover, in other portions of *UDC* that were not cited by the Solicitor General, I expressly distinguished computers from human minds. Earlier in my introduction, I lamented that "newspapers are forever reporting the latest feat performed by an electronic brain. As a result amazing intellectual powers and super-human thinking abilities have been attributed to digital computers." *UDC* at 2. I then stated that "digital computers can not 'think,' and as we shall see, they are not as complicated as most people believe. In fact, computers owe many of their capabilities to their inherent simplicity." *UDC* at 3. I went on to explain that "No computer 'thinks for itself'; it only operates at high speed according to the instructions it has received." *Id.*

Finally, even if not taken entirely literally, the Solicitor General used the Benrey Quote to support a more general argument: "the functions themselves are the *same procedures* which a human being would perform in working the same computation, but reduced to the physical characteristics of the device." Solicitor General Brief, 1972 WL 137527, at *7 (emphasis added). This statement is false. The procedures performed by computer are entirely different both in form and process from what a human does, even if both would ultimately achieve the same results. For example, when a computer multiplies two numbers, the underlying procedures are entirely different from what a human would do. What a human does in a few operations to multiply two digits, say "9 x 8," requires dozens of operations at the level of individual logic gates (complexes of transistors). The very purpose of creating and programming a digital computer is to implement processes that are beyond the capabilities of a human being using paper and pencil—and thus take advantage of the computer's ability to perform its processes with speed and accuracy that exceed human capabilities.

Further, computers do not merely "speed up" calculations that a human could do by "head and hand." In many cases, the computer performs computations that are simply beyond human capability in any practical sense—calculations that would literally take the lifetimes of hundreds of humans can be done in a few hours by some computers. More to the point, the calculations are not performed as ends in themselves merely to produce some mathematical result. Instead, complex mathematical procedures typically represent real-world problems, such as navigational routes for airplanes, weather forecasts, or engineering calculations on the stresses that a building can withstand during an earthquake.

Thus, whether taken literally or more generally, the Benrey Quote does not support the arguments made by the Solicitor General and adopted by the

Supreme Court as the operations of digital computers in relationship to human minds.[4]

B. Benson's Invention Was Not a "Pure" Mathematical Algorithm Dictated by the Axioms of Mathematics

The second premise of the Solicitor General's argument, and one that was also adopted by the Court, was that Benson claimed to have invented the algorithm for binary coded decimal to binary conversion *per se*, and that this algorithm was derivative of the axioms of mathematics:

> The "discovery" which respondents claim here is nothing more than a sequence of mathematical steps which differ very little from the mental steps that an ordinary human being could be expected to follow. Their theorem follows automatically from the definitions of pure binary, decimal, and BCD numbers and from the axioms for or definitions of addition and multiplication in the binary system.

Solicitor General Brief, 1972 WL 137527 at *15.

> The applicants' process differs only in some minor respects from the mental steps that an ordinary human being could be expected to follow (see pp. 12-13, *supra*). In effect, they seek a patent grant on a theorem that follows

---

[4] For further details of the architecture of digital computers, *see UDC* at 9-11, 44-53, 64-105.

> automatically from the definitions of pure binary, decimal, and BCD numbers, and from the axioms for or definitions of addition and multiplication in the binary system.

Id. at *19.

> The respondent applicants vary the ordinary arithmetic steps that a human being would use to accomplish such a conversion, by changing the order in which they are accomplished, changing the symbolism for writing the multiplier used in some steps (using a blank space for a terminal zero), and by taking subtotals after each successive operation.

Id. at *12.

The *Benson* Court accepted these statements as authoritatively correct, and almost verbatim:

> The patent sought is on a method of programming a general purpose digital computer to convert signals from binary coded decimal form into pure binary form.

Benson, 409 U.S. at 65.

> The method sought to be patented varies the ordinary arithmetic steps a human would use by changing the order of the steps, changing the symbolism for writing the multiplier used in some steps, and by taking subtotals after each successive operation.

Benson, 409 U.S. at 67.

However, Benson *did not* claim that he discovered the algorithm for BCD-to-binary conversion but rather a specific way of performing that algorithm using a particular combination of hardware elements:

> The present case, it will be noted, does not describe the claimed method by means of a formula. Such a formula could be devised, but no real value would be promoted by doing so. The rejected claims do, however, use terms such as storing, shifting and adding. These terms, particularly adding, do have a mathematical flavor and do suggest a mathematical calculation. It should be noted, however, that the problem solved by appellants' invention is not a mathematical problem. *The translation of binary-coded decimal numbers to binary numbers was solved long ago, indeed, as soon as BCD numbers were thought of in the first instance. Rather, the problem solved by appellants' invention is a machine problem, the slow speed and large storage capacity required for prior art translators.* Appellants' solution to this problem is mathematical only in the sense that such a translation must be governed broadly by the required mathematical equivalences of the results. The inventiveness of the actual methods claimed, however, lies in the special use of the machine capabilities (adding, shifting, testing) to solve the problem. That is, ordering the machine operations as specified in appellants' claims does speed up the translation and does reduce the storage requirements.

Appeal to Board of Appeals, February 27, 1967, 84-85, found in Appendix to *Gottschalk v. Benson* at 75 (emphasis added). The file history in *Benson* explains: "More specifically, the present invention is directed toward simplifying such numerical conversions by simplifying the apparatus necessary to achieve this conversion and increasing the speed at which conversion can be accomplished." *Id.* at 52. Benson's counsel specifically discussed how previous methods of BCD-decimal conversion required significant use of memory, and Benson's invention improved over these by specific features:

> The Bird patent discloses several related means for translating or converting a binary number into the equivalent binary-coded decimal number. In the embodiment of FIG. 1 for example, the binary-coded decimal equivalent of each binary position is stored on drum 1. These equivalents are accumulated in shift register 9 for all those binary positions in which the binary number in shift register 4 has a "one". As noted by Bird (Col. 2, lines 23-30) this requires the storage of twenty-seven different decimal equivalents, each thirty-two digits long, a total of 864 digits to be stored. As noted in applicants' specification (page 1, lines 16-25) it is systems just such as Bird's which applicants' invention is intended to be an improvement over. The "memory table" on Bird's track 2 (864 digits) represents considerable storage. Moreover, each step requires a complicated addition operation, increasing the likelihood of error. It is also noted that applicants provide a method for converting BCD to

> binary while Bird is concerned with converting binary to BCD.
>
> Applicants require no separate storage of conversion values. The conversion value is instead available in the two simple "add one" instructions at store addresses 115 and 117 (Table, page 7). By shifting the number so as to make these simple additions at binary digit positions of successively greater significance, these same two instructions serve to generate all of the conversion value required. Moreover, since the overall conversion involves no more than the iteration of a short, simple sequence, less storage is required and errors are less likely to occur.

Id. at 20-21.

In short, Benson's algorithm was *not* dictated by the axioms of mathematics but rather was a specific improvement on existing BCD-decimal conversions, designed to take advantage of the speed differences of then-available shifting registers over memory circuits. Of course, had Benson's invention instead been the BCD-binary algorithm itself, then the Court's concern regarding a mathematical formula being like scientific truth in this specific case would have been well-founded, and the holding proper.

Thus, the second premise of the Solicitor General's argument was also factually incorrect.

C. All Mathematical Algorithms Are Not Scientific Truths

The final premise of the Solicitor General's argument that was uncritically accepted by the Supreme Court was that all mathematical algorithms are scientific truths. The Solicitor General argued:

> Indeed, the Court has repeatedly held that a scientific principle, rule, formula or mathematical expression is not a patentable process, regardless of the novelty or importance of the discovery. *Le Roy v. Tatham*; *Mackay Radio & Tel. Co. v. Radio Corporation*; *O'Reilly v. Morse*; *Tilghman v. Proctor*; *Risdon Iron and Locomotive Works v. Medart*.

Solicitor General Brief, 1972 WL 137527, at *20-21 (citations omitted). Here, the Solicitor General states that the Court has "repeatedly held" that a "formula or mathematical expression" is not patent eligible. But that is *not* what the Court had "repeatedly held." First, mathematical expressions were not at issue in *Le Roy*, *O'Reilly*, *Tilghman*, or *Risdon*. Second, in *Mackay Radio* the invention was described in mathematical terms, but the Court was very careful in its phrasing: "While a scientific truth, *or the mathematical expression of it*, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." *Mackay Radio & Tel. Co. v. Radio Corp. of Am.*, 306 U.S. 86, 94 (1939) (emphasis added). The use of "or" results in a completely different meaning from that suggested by the Solicitor General. The *Mackay Ra-*

dio Court simply stated that a scientific truth, although it might be expressed by a mathematical formula, is not patent eligible, which is certainly the law. That is quite different from, and is not a holding that, *all* mathematical algorithms are ineligible as scientific truths, as suggested by the Solicitor General.

While the Court's opinion in *Benson* did correctly quote from *Mackay Radio*, the Court nonetheless appeared to have accepted the Solicitor General's interpretation of this statement as implying that mathematical expressions *are* scientific truths, rather than for it what it says—that they *can be used* to express them.

The difference between these interpretations is critical, and has fundamentally influenced the development of the patent law. Mathematics can certainly be used to describe laws of nature and scientific truths, such as $E=mc^2$, because it "is unique among languages in its ability to provide precise expression for every thought or concept that can be formulated in its terms." A. Adler, *Mathematics and Creativity*, The New Yorker, February 19, 1972, p. 39-45. But mathematics is also used to describe mundane things as well, such as fuel-efficient aircraft approach procedures (U.S. Patent No. 8,442,707), compressing video for transmission on cell phones (U.S. Patent No 8,494,051), efficiently allocating farming resources (U.S. Patent No. 6,990,459), or calculating golf handicaps and the difficulty of golf courses (U.S. Patent No. 8,282,455). Many of these mathematical algorithms are "models" that seek to represent reality in a form that can be understood by engineers, or in many cases that can then be manipulated by computers. No one would assert that such algorithms are "scientific truths": airplanes, video, farming, and golf are entirely human and social constructs, not *a priori* truths about nature, and specific algorithms in these fields are likewise human inventions. These are instead examples of *applied* mathematics ("Applied mathematics is a branch of mathematics that concerns itself with mathematical methods that are typically used in science, engineering, business, and industry," http:/en.wikipedia.org/wiki/Applied_math-ematics) rather than *pure* mathematics ("[P]ure mathematics is mathematics that studies entirely abstract concepts." http://en.wikipedia.org/wiki/Pure_mathematics).

Indeed, if all applied mathematical algorithms were in fact scientific truths, it would logically follow that any inventions that related to using computational methods would be ineligible, whether they were implemented in software or hardware. This certainly is not the right outcome and is completely inconsistent with the fact that there are thousands of patents directed to adding machines and calculators for performing addition, multiplication, division, and so forth. Further, it would mean that much of modern communications technology as used in smartphones and the Internet—communications protocols, encryption, audio and video compression—would likewise be no longer patent eligible.

The foregoing shows that the Solicitor General's arguments in *Benson*—about Benson's invention, about the nature of mathematical algorithms, and about the operation of computers—a theory that the

Supreme Court expressly adopted, were based on three factually and theoretically incorrect premises.

II. *BENSON* EXTENDED THE MENTAL STEPS DOCTRINE TO COMPUTER-IMPLEMENTED INVENTIONS

The holding in *Benson* primarily depended on the second and third premises set forth above:

> What we come down to in a nutshell is the following. It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case. The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.

Benson, 409 U.S. at 71-72.

Historically, the mental steps doctrine performed a useful screening function to exclude claims that directly set forth steps *necessarily* performed in the human mind, given the disclosure of the patent. The doctrine arose in cases involving inventions that occurred before the use of computers in business and industrial applications. The patent disclosures thus described the invention in terms of mathematical procedures that could only be performed mentally by "head and hand," or human judgments guided by mathematical or other considerations. That is, there was no disclosure of any way to perform the mathematical operations *except* by mental operations. See *In re Bologaro*, 20 C.C.P.A 845 (1931) (method for setting lines of type using a mathematical procedure to determine average number of spaces per line not patent eligible; no disclosure of any machine for performing claimed method); *Don Lee v. Walker*, 61 F.2d 58 (9th Cir. 1932) (method of determining the weights and positions of counterweights on engine balance shaft not patent eligible; no disclosure of any apparatus to perform the necessary calculations); *Haliburton Oil Well Cementing Co. v. Walker*, 146 F.2d 817 (9th Cir. 1944) (method of determining the location of an obstruction in a tube by observing time delays of echoes and solving a mathematical equation not patent eligible; "We think these mental steps, even if novel, are not patentable"); *In re Heritage*, 32 C.C.P.A. 1170, 1174 (1945) (method of "producing a porous coated fiber board" including a step of selecting particular amounts of coated fibers, with no disclosure of any apparatus or machine used to make the selection, not patent eligible; claims "are essentially directed to a purely mental process of making a selection of the amount of coating material to be used in coating a porous fiber board").

This interpretation of the mental steps doctrine is confirmed, in an early treatise on the patent eligibility of software, by noted Professor Irving Kayton:

> Purely "mental steps" are considered to be steps which may only be performed in, or with the aid of, the human mind. This is quite in

> contrast to "purely physical steps" which may only be performed by physical means, machinery, or apparatus. Purely mental steps (e. g., "believing") are quite different from purely physical steps (e. g., "heating") in many respects, not the least of which is that the former are much less susceptible to specific definition or delineation. Between the purely mental and purely physical ends of the spectrum there lies an infinite variety of steps that may be either machine-implemented or performed in, or with the aid of, the human mind (e. g., "comparing" and "determining"). In ascertaining whether a particular step is "mental" or "physical," each case must be decided on its own facts, considering all of the surrounding circumstances, to determine which end of the spectrum that step is nearer. It may well be that the step of "comparing" may be "mental" in one process, yet "physical" in another. Disclosure of apparatus for performing the process without human intervention may make out a prima facie case that the disclosed process is not mental and is, therefore, statutory.

Kayton, *Patent Protectability of Software: Background and Current Law*, in The Law of Software 1968 Proceedings B-25 (1968).

Thus, until *Benson*, no court had expressly applied the mental steps doctrine to computer-implemented inventions. *Benson* has been understood to have extended the mental steps doctrine to computer-implemented inventions. *CyberSource*

Corp. v. Retail Decisions, Inc., 654 F.3d 1366, 1371 (Fed. Cir. 2011) ("in finding that the process in *Benson* was not patent-eligible, the Supreme Court appeared to endorse the view that methods which can be performed mentally, or which are the equivalent of human mental work, are unpatentable abstract ideas—the 'basic tools of scientific and technological work' that are open to all") (citing *Benson*, 409 U.S. at 67).

Accordingly, to extend the mental steps doctrine in this fashion, the Court in *Benson* necessarily relied on the assumption that the operations of a computer are "the same procedures which a human being would perform" by "head and hand." As shown above, this view was particularly set forth by the Solicitor General in his brief to the Court and provided a demonstrably false premise.

Unfortunately, the Benrey Quote continues to this day to be cited as authority and a statement of fact about how computers operate, and has continued to substantively impact both the case law and the outcome of many patent cases. For example, the Federal Circuit has stated:

> As the Supreme Court has explained, "[a] digital computer . . . operates on data expressed in digits, solving a problem by doing arithmetic as a person would do it by head and hand." *Benson*, 409 U.S. at 65. Indeed, prior to the information age, a "computer" was not a machine at all; rather, it was a job title: "a person employed to make calculations." Oxford English Dictionary, *supra*. Those

> meanings conveniently illustrate the interchangeability of certain mental processes and basic digital computation, and help explain why the use of a computer in an otherwise patent-ineligible process for no more than its most basic function—making calculations or computations—fails to circumvent the prohibition against patenting abstract ideas and mental processes.

Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada, 687 F.3d 1266, 1277 (Fed. Cir. 2012) (holding patent claims to a computer-implemented system non-statutory as mental steps). Here too, the Benrey Quote has been taken out of context and used in a manner at odds with my intended purpose and meaning. As should be clear, the digital operations of a computer are not interchangeable with the mental processes of a human. That both can be *described* in a common way does not *make* them the same in fact. A common description should not be surprising, since, after all, humans invented the formal symbolism of arithmetic, and likewise invented computers, using that formal symbolism to define their operations. If the programmed operations of a computer are interchangeable with the mental processes of a human, then so too are the mechanical operations of an adding machine, since these operations can likewise be described as the "same procedures" performed by a human. Clearly, this result is not correct, and thus it implies that the "interchangeability" premise is false.

III. THE MENTAL STEPS DOCTRINE DOES NOT APPLY TO PROGRAMMED GENERAL PURPOSE COMPUTERS

The mental steps doctrine is inapplicable to digital computers and computer-implemented inventions for several reasons.

First, prior to the widespread usage of the general purpose computer, many inventions were created, and many patents granted, for mechanical and electrical machines that performed calculations. For example, between 1900 and 1960, there were over 2,300 patents issued that related to mechanical computing devices. That such devices were patent-eligible subject matter seems beyond dispute, and *amicus* has been unable to identify any federal cases in which claims to such devices or their methods of operation were held to be ineligible subject matter. That calculating machines such as these were performing simple arithmetic that a human could easily do by "head and hand" using the "same procedures" as humans, did not disqualify them as patentable subject matter. This is because the mathematical operations had been mechanized into physical elements: the "locus of the operation" was in the mechanical or electrical elements of the machine.

Most calculating machines typically could only perform the individual mathematical operations, such as addition, subtraction, multiplication, division, logarithm, and so forth. To perform a complex series of mathematical calculations therefore required the human operator to control the sequence and execution of a series of calculations, as well as in many cases to store, typically on a notepad, intermediate results for later entry into the machine. In short, even though the locus of the operation was in the machine, the locus of control in those devices was always in the mind of the human operator, whether he was using a desk calculator, a slide rule, or an abacus.

Accordingly, in patent cases decided prior to the widespread application of computers, the courts were correct to hold that a claim to mathematical procedures or use of formula was essentially one for mental steps, because there was then no known way to have a machine automatically perform the entire mathematical process by itself.

The advent of digital computers represented a fundamental change in where control of the operations is held. In a programmable computer, the locus of control is in the machine itself: A computer program controls the operation of the computer by sequentially changing the signals stored and manipulated by the computer. These signals are not representative of the mental states of a human but rather are signals that electronically represent low-level "instructions" that the computer can execute. At a minimum, just as the mechanical or electrical implementation of calculating machines would not be ignored in deciding patent eligibility, the implementation of a digital computer should not be ignored either.

The only reason to ignore the presence of digital computer elements, such as the shift register in *Benson*, or even a general purpose computer itself, is if one assumes that computers perform mental steps. Once this assumption is removed, there is no principled reason to distinguish between the mechanical nature of a calculating machine and the computer technology in digital computers. Both likewise contribute to patent eligibility.

Indeed, prior to the advent of programmable digital computers, there were several generations of electromechanical computers that used electromechanical devices, instead of integrated circuits. See R. Dorf, *Computers and Man* 13-23 (1974) (reviewing history of electro-mechanical computers leading up to the modern digital computer architecture developed by John Von Neumann in the 1940s). Certainly, if Benson's claim recited conventional electro-mechanical elements, such as relays and switches, instead of a shift register to perform the shifting and other steps, there would have been no doubt that the claim was sufficiently tied to a machine. There is no reason to discriminate against the use of conventional digital computer elements for patent eligibility, if such basic technology would suffice for a practical application.

The objection may be raised here that while a digital computer itself is patent eligible as an apparatus, what is disputed is whether a particular *way* of operating a digital computer under the control of a computer program is patent eligible, given that the digital computer is merely at that point a conventional apparatus used in the method.

This objection is answered in two ways. First, 35 U.S.C. § 100(b) states: "The term 'process' means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material." Under § 101, a process is eligible subject matter if it is a *new use* of an existing machine, including if that machine is characterized as a "general purpose computer." That is, the statute does not exclude digital computers from the scope of "known machines" on which new, patent eligible processes can be implemented. There can be no dispute that a method of operating a digital computer under the control of a computer program to perform a specific function is performing a process under the statute.

Whereas the first answer is a result of the patent law, the second answer is a result of the underlying science of digital computers. One of the fundamental discoveries in computer science was made by Alan Turing. "The principle of the modern computer was first described by computer scientist Alan Turing, who set out the idea in his seminal 1936 paper." See "Computer," http://en.wikipedia.org/wiki/Computer (providing a detailed discussion of Turing's contribution to computer science, and his paper, Turing, A. M., *On Computable Numbers, with an Application to the Entscheidungsproblem* (1937) [Delivered to the Society November 1936]).

Turing proposed his "Turing machine," which is a generalized model of modern digital, programmable computers. Turing proved that a Turing machine, executing a computer program for an algorithm, can perform any calculation or any operation that a specific combination of logic circuits could perform. That is, a general purpose computer can be programmed to do any procedure or calculation that a "hardwired" computer had been designed to do.

Thus, from a scientific perspective there is no logical difference between a general purpose computer executing a computer program to perform a mathematical procedure and a specific computer hardware circuit that performs the same procedure without a computer program. From the standpoint of the relevant computer science principles, when a general purpose computer executes a computer program, it is equivalent to a specific hardware computer. Since there would be no dispute that a particular arrangement of logic circuits in the specific hardware computer is patent eligible, it makes no scientific sense to hold that a general purpose computer performing the equivalent method as the specific computer is likewise not patent eligible. To distinguish between these two ways of implementing a computer invention would make patent eligibility rest on the specific technological form of the implementation, even if these forms are considered equivalent by those of skill in the art.

This latter conclusion is precisely what the Federal Circuit held in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc). The *Alappat* court was correct when it stated "programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *Id.* at 1454. While the *technology* of computers has changed since 1994—they are smaller, faster, and more powerful—the underlying *science* of general purpose computers and their operation by computer programs has not changed since their conception by Turing in the 1930s and their subsequent realization in the first "stored program computers" in the early 1940s.

Indeed, the functional equivalence of hardware and software on a general purpose computer remains a vitally important aspect of modern technology. Electronic Design Automation (EDA) is a type of computer software used to design electronic systems, including integrated circuits. "Electronic Design Automation," http://en.wikipedia.org/wiki/Electronic_design_automation. Very generally, the desired functionality of a computer chip, including the most complex of today's microprocessors, is first defined using computer algorithms—in other words, in software. These algorithms are ultimately translated to the specific logic circuits—in other words, in hardware. This is only possible because of Turing's proof of the equivalence of a general purpose computer executing an algorithm and a corresponding specific computer circuit. Today, EDA is a multi-billion dollar industry, and almost every consumer, commercial, and industrial computer product is designed using EDA. It is not an exaggeration to say that, but for the equivalence of a general purpose computer executing a software program and a specific hardware computer, this Court still would be reading briefs printed on a mechanical printing press, from handset type.

CONCLUSION

The answer to the question presented is *Yes.* Inventions that are directed by their claim terms to computer implementations are and should be patent-eligible subject matter, regardless of whether the computer elements are conventional or not. The recitation of a process executed by a general purpose computer or its elements, such as a processor memory, data storage, and input/output devices, are sufficient, from a technological point of view, to articulate an invention restricted to a computer, rather than a mere abstract idea or purely mental process.

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CURIAE
BRIEF

No. 13-298

In the Supreme Court of the United States

ALICE CORPORATION PTY., LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL & CLS SERVICES LTD.,

Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF BSA | THE SOFTWARE ALLIANCE AS *AMICUS CURIAE* IN SUPPORT OF RESPONDENT

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INTEREST OF THE *AMICUS CURIAE*

BSA | The Software Alliance is an association of the world's leading software and hardware technology companies. On behalf of its members, BSA promotes policies that foster innovation, growth, and a competitive marketplace for commercial software and related technologies. BSA members pursue patent protection for their intellectual property and as a group hold a large number of patents. They also create products that are frequently subject to unjustified patent infringement claims. Because patent policy is vitally important to promoting the innovation that has kept the United States at the forefront of software and hardware development, BSA members have a strong stake in the proper functioning of the U.S. patent system.[1]

The members of the BSA include Adobe, Apple, ANSYS, Autodesk, AVG, Bentley Systems, CA Technologies, CNC/Mastercam, Dell, IBM, Intel, Intuit, McAfee, Microsoft, Minitab, Oracle, PTC, Rockwell Automation, Rosetta Stone, Siemens PLM, Symantec, Tekla, and The MathWorks.

SUMMARY OF ARGUMENT

Software innovations are a critical engine of today's economy that touch myriad aspects of everyday life.

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[1] Pursuant to Rule 37.6, *amicus* affirms that no counsel for a party authored this brief in whole or in part and that no person other than *amicus* and its counsel made a monetary contribution to its preparation or submission. The parties' letters consenting to the filing of this brief have been filed with the Clerk's office.

The discussion of software patentability, however, is often dominated by a significantly different kind of patent claim. Like the claims in this case, some patents merely take a well understood, fundamental concept (here, the business method of intermediated settlement) and claim application of that idea on a computer. That amounts to nothing more than a patent on the idea itself. Section 101 bars such claims, which are not "software" at all.

Concluding that the claims are not patentable in this straightforward case—which is effectively "*Bilski* on a computer"—fully accords with the principle that true software innovations are patent-eligible.

First, software engineering is like any other engineering discipline: innovations are the product of hard work and significant investment, and they add substantial value to the economy. This point is proven by the tens of billions of dollars that companies spend each year researching and developing new software innovations. The benefits of these advances are seen in all aspects of the economy, through pathbreaking new products that touch virtually every aspect of modern life. Given the central importance of software to the economy, patents for the software innovations that power the Information Age are every bit as justified as the patents for industrial processes that powered American growth a century ago.

Second, software innovations generally are patentable under Section 101. Software patents describe a "process" for accomplishing a particular end, which is an express statutory basis for patent eligibility. And *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3224 (2010), expressly rejected artificial limitations on what qualifies as a patent-eligible "process." Moreover, software innovations create a new "machine" when they program a computer to perform a particular, useful function. Finally, software innovations are not categorically exempt from Section 101 as laws of nature, physical phenomenon, or abstract ideas.

Third, because the Patent Act contains very substantial additional requirements before a patent may be granted, Section 101 is not—nor should be viewed as—the sole guardian of patent quality. Section 101 applies to software claims in the same manner as to innovations in every other field of endeavor. Most software claims—which generally relate to needs, problems, or opportunities unique to the digital environment—do not implement a law of nature, physical phenomenon, or abstract idea at all. With respect to these claims, the implicit exemptions to Section 101 are irrelevant.

When a claimed invention *does* implement such a concept, a court must consider "[w]hat else is there in the claims," to determine whether it does "significantly more" than describe the unpatentable concept. *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1297 (2012). If it does not do "significantly more," the claim is barred by Section 101.

Fourth, application of these principles is straightforward in this case. Unlike most true software claims, the claims here *do* implement an abstract idea—the idea of intermediated settlement. And these claims do not do "significantly more" than describe the abstract idea as implemented on a computer. The various forms of the claims do not alter the conclusion that they are not patentable under Section 101.

ARGUMENT

I. Society Has Reaped Enormous Benefits From Computer Software Patents.

"[M]any breathtaking software-implemented innovations power our modern world, at levels of efficiency and performance unthinkable even just a few years ago," then-PTO Director David Kappos recently explained. David Kappos, Keynote Address at Center for American Progress, *An Examination of Software Patents* (Nov. 20, 2012), http://tiny.cc/33zfow. "[P]atent protection" therefore "is every bit as well-deserved for software-implemented innovation" as for earlier innovations "that enabled man to fly, and before that for the innovations that enabled man to light the dark with electricity, and before that for the innovations that enabled the industrial revolution." *Ibid.*

The patentability of software is critically important to the U.S. economy. Subjecting software to patentability rules more restrictive than those applicable to other categories of inventions would reduce economic growth and diminish innovation in software that touches virtually every aspect of American life.

A. Software Contributes Substantially To The U.S. Economy.

Just as civil engineers design the physical infrastructure of bridges and roads, software engineers build the digital world that touches nearly every aspect of modern life. Indeed, "most of the planet is currently run by software" as "[o]ur financial systems, energy production, transportation networks and a host of other fundamental systems are run using software." Henry J. Cittone, *Some Math Is Hard,* *Some Not: Rules for Patentable Subject Matter of Software*, 38 Rutgers Computer & Tech. L.J. 193, 193-194 (2012).

Software is used by "[p]atients with chronic diseases [who] wear[] devices that monitor and help to manage their conditions;" by "cities [to] monitor, manage, and reroute traffic during peak times;" and by insurers to "adjust[] premiums based on real-time driving habits of customers who agree to have sensors placed in their cars." The Boston Consulting Group ("BCG"), *The Great Software Transformation* 11-12 (2013), http://tiny.cc/rkd99w.

Software controls everyday devices, like tablet computers and smartphones—of which there will be more than 5 billion by 2018. BCG, *supra*, at 6. It is "hard to overestimate the pivotal role of software in altering a wide range of traditional ways of working;" indeed, "[s]oftware is the engine that has driven many, if not most, of the most disruptive business models introduced over the past 25 years." *Id.* at 5. In short, "software is at the heart of the global economy." *Ibid.*

Investment in software reflects its critical importance to American industry. In 2008, companies invested approximately $46.9 billion in research and development for software and computer-related services—approximately 16% of *total* industrial R&D expenditures for the nation. Nat'l Sci. Bd., Science and Engineering Indicators, at 4-21 & 4-23 (2012), http://tiny.cc/xicwbx. Reflecting this substantial investment, software firms are leading innovators, "with 77% of companies" engaged in software development "reporting the introduction of a new product or service compared to the 7% average for all non-manufacturing industries." *Id.* at 6-47.

Software R&D spending is growing at substantial rates. In 2013, R&D spending in the software and Internet sector grew approximately 22.1% from the prior year, compared to just 5.8% R&D growth for the whole economy. Barry Jaruzelski et al., *The Global Innovation 1000: Navigating the Digital Future*, forthcoming 73 Strategy & Business 33, 36-37 (Winter 2013), http://tiny.cc/2smeax. BSA member companies spend in excess of $32 billion each year on research and development to expand their innovation portfolios. See BSA, *Patent Reform: The Verdict Is In* 4 (2007), http://tiny.cc/kjd99w.

These substantial investments in software R&D confirm that innovation in software is just like innovation in any other engineering discipline—it takes substantial amounts of ingenuity, effort, and expense to develop new technologies.

Software is also a critical driver of investment in the United States. Software companies accounted for $21.6 billion of foreign direct investment in the United States in 2009. Nat'l Sci. Bd., *supra*, at 6-46, tbl. 6-7. And venture capital firms invested approximately $18 billion between 2007 and 2010 in software companies. *Id.* at 6-58, to -60 & fig. 6-51.

Moreover, the software industry creates a substantial number of high-paying American jobs. Currently, software companies and related services employ approximately two million U.S. workers, paying salaries that are roughly 195% of the national average. Robert W. Holleyman, BSA President and CEO, *Testimony before the United States House of Representatives Committee on Energy and Commerce, Subcommittee on Commerce, Manufacturing and Trade,* at 2 (Mar. 16, 2011), http://tiny.cc/p3nlow.

Software sales outside the United States constitute a substantial portion of U.S. export markets, significantly strengthening the U.S. economy. Software accounts for approximately $36 billion of U.S. exports, and leading software companies make as much as 60% of their revenue on overseas sales. Holleyman, *supra*, at 2.

The benefits of software are not limited to the technology sector itself. Information technology innovations have been described as "the key factor responsible for reversing the 20-year productivity slowdown from the mid-1970s to the mid-1990s and in driving today's robust productivity growth." Robert D. Atkinson & Andrew S. McKay, *Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution* 10 (Info. Tech. & Innovation Found. 2007), http://tiny.cc/3ld99w. Software helps companies "collaborate more effectively internally and externally, scale operations faster, operate more efficiently, and innovate and experiment more strategically." BCG, *supra*, at 11. Today, "all companies are effectively tech companies." *Ibid.*

Given the integral role computer software plays in all aspects of modern life, it comes as little surprise that inventors are increasingly seeking patent protection for software innovations; "the number of software-related patents grew as computers were integrated into a greater expanse of everyday products." See U.S. Gov't Accountability Office, Report to Congressional Committees, *Intellectual Property: Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality*, GAO-13-465, at 11-13 (2013), http://tiny.cc/0md99w. Currently, about half of all new patents relate in some manner to computer software. *Ibid.*

B. The Continued Patentability Of Software Is Critical To Economic Growth.

The availability of patent protection for software inventions has been an essential incentive for the innovation that has produced this wide array of benefits. New limitations on that patent protection would therefore inflict very significant injury on the U.S. economy.

Simple economics makes clear that, if patent protection for software were curtailed, the adverse consequences would be swift and severe. "Discrimination against a form of innovation that is increasingly critical to technological advancement, indeed that in many areas dominates technological advancement, makes no sense." Kappos, *supra*. See also Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 Cal. L. Rev. 1, 5 (2001) ("[B]oth economic theory and practical experience suggest that the availability of patents for software promotes innovation by supplying (additional) incentives to inventors.").

Indeed, as early as 1992, congressional reports recognized that "patent protection is of importance to the U.S. software industry, both domestically and in the global market." U.S. Congress, Office of Technology Assessment, *Finding a Balance: Computer Software, Intellectual Property and the Challenge of Technological Change* 23 (1992), http://tiny.cc/-gkcwbx.

First, because patent protection is a critical incentive to expenditures for software research and development, limitation of software patentability would lead to a decline in software innovations. Without intellectual property protection, prospective software entrepreneurs face serious risks that competitors will free-ride on their innovations by pilfering the essential elements of a software program. See, *e.g.*, Bradford L. Smith & Susan O. Mann, *Innovation and Intellectual Property in the Software Industry: An Emerging Role for Patents?*, 71 U. Chi. L. Rev. 241, 241-242 (2004). With proper protection, by contrast, potential innovators are motivated to pursue new inventions and to proceed to commercial development to collect their economic rewards. *Id.* at 256-257.[2]

Second, any new obstacles to software development would carry a penalizing multiplier effect that could threaten the broader economy. Because software is at the heart of the efficiency revolution that has contributed vastly to U.S. economic growth over the past few decades, causing companies to divert their resources away from software research and development would have a ripple effect on productivity, affecting all segments of the economy. See BCG, *supra*, at 11.

Third, limiting software patentability would particularly harm small and start-up entities, which rely upon software patents in order to gain critical early funding. Software patents "play a role of some importance in the development of firms seeking to enter the software industry" insofar as they significantly improve a company's efforts to obtain venture capital. Ronald J. Mann & Thomas W. Sager, *Patents,*

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[2] Although software is protected by copyright (see 17 U.S.C. § 117), "[u]nlike a patent, a copyright gives no exclusive right to the art disclosed; protection is given only to the expression of the idea—not the idea itself." *Mazer* v. *Stein*, 347 U.S. 201, 217 (1954).

Venture Capital, and Software Start-Ups, 36 Research Policy 193, 194 (2007), http://tiny.cc/snd99w. Thus, in the software space, start-up "[f]irms that have higher numbers of patents and patent applications pending are more likely to receive funding from outside investors, and more likely to subsequently 'exit' from the entrepreneurial phase through IPO or acquisition." Iain M. Cockburn & Megan MacGarvie, Nat'l Bureau of Econ. Research, Working Paper 13644, at 42 (2007), http://tiny.cc/nod99w.

Fourth, any undue limits on software patents would cause firms to move their software development efforts outside the United States. "[A] worldwide comparison of patents issued for software-related inventions" shows that "firms will locate their R&D activities in nations with strong intellectual property rights and sound legal institutions." Douglas Lippoldt & Piotr Stryszowski, Organisation for Economic Co-operation and Development, *Innovation in the Software Sector* 14-15 (2009), http://tiny.cc/usd99w. Given that software is a critical aspect of continued U.S. economic success, there can be no justification for diminishing patent protection and driving this enormously important industry outside the country.

II. Software Innovations Are Eligible For Patent Protection.

Section 101's broad language—extending patent eligibility to "any * * * process, machine, manufacture, or composition of matter, or any new and useful improvement thereof"—plainly encompasses software innovations. Indeed, while the *en banc* Federal Circuit disagreed about many issues in this case, not one judge disputed that software, as a general matter, is patent-eligible.

That unanimity is not surprising. Decades ago, this Court found claims involving the use of a "computer program" eligible for patent protection. *Diamond* v. *Diehr*, 450 U.S. 175, 181 (1981). A claim "does not become nonstatutory simply because it uses a * * * computer program." *Id.* at 187. The Federal Circuit has found software patentable in a substantial number of cases.[3]

Most patent applications involving software satisfy Section 101: software innovations are eligible under the plain terms of the statute, and the implicit exemptions to Section 101 do not categorically exclude software.

A. Software Is Patent-Eligible As Both A "Process" And As A "Machine."

This Court has recognized that Section 101 should be interpreted to extend patent eligibility broadly. Because the statutory provision contains "expansive terms modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope," so as "to ensure that ingenuity should receive a liberal encouragement." *Bilski*, 130 S. Ct. at 3225 (quotations omitted). "Section 101 is a 'dynamic provision designed to encompass new and unforeseen inventions.'" *Ibid.*

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[3] See, *e.g.*, *Research Corp. Techs., Inc.* v. *Microsoft Corp.*, 627 F.3d 859, 862-864 (Fed. Cir. 2010); *Eolas Techs. Inc.* v. *Microsoft Corp.*, 399 F.3d 1325 (Fed. Cir. 2005); *State St. Bank & Trust Co.* v. *Signature Fin. Grp. Inc.*, 149 F.3d 1368 (Fed. Cir. 1998); *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc). So too had its predecessor court, the United States Court of Customs and Patent Appeals. See, *e.g.*, *In re Freeman*, 573 F.2d 1237 (C.C.P.A. 1978); *In re Bernhart*, 417 F.2d 1395, 1396 (C.C.P.A. 1969).

(quoting *J.E.M. Ag Supply, Inc.* v. *Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135 (2001)).

Software qualifies as a "process" under Section 101, which the Patent Act defines as a "process, art or method." 35 U.S.C. § 100(b). The Court looks to "dictionary definitions" (*Bilski*, 130 S. Ct. at 3226) to determine the "common meaning" of Section 101's terms (*Diehr*, 450 U.S. at 182).

A process is "a particular method or system of doing something, producing something, or accomplishing a specific goal." Webster's Third New International Dictionary 1808 (1986). A "method" is "a way, technique, or process of or for doing something." *Id.* at 1423.

Software innovations fall well within this broad definition of a process. By its very nature, a software innovation specifies a series of actions or operations to be taken by computer hardware in order to accomplish some goal. Likewise, software innovations will disclose a systematic procedure or technique that is used in computer hardware. In fact, "software" itself is defined as "[t]he programs and procedures required to enable a computer to perform a specific task." The Compact Oxford English Dictionary 1819 (2000).

There is no basis for imposing an artificial limitation on the term "process" that would exclude software. The Court "has 'more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed.'" *Bilski*, 130 S. Ct. at 3226 (quoting *Diehr*, 450 U.S. at 182). This is so, in no small part, because any such artificial, "categorical rule[]" "might have wide-ranging and unforeseen impacts." *Id.* at 3229.

Moreover, "Congress employed broad general language in drafting § 101 precisely because * * * inventions are often unforeseeable." *Diamond* v. *Chakrabarty*, 447 U.S. 303, 316 (1980).

In *Bilski*, for example, the Court expressly rejected the contention that a process is eligible for patent protection only when it passes the so-called "machine-or-transformation" test. That approach would have limited patent-eligible processes to only those that are "tied to a particular machine or apparatus" or that "transform[] * * * [an] article into a different state or thing." *Bilski*, 130 S. Ct. at 3225 (quotation omitted). Such a restrictive approach, the Court stated, would be "inconsistent with the text and the statute's purpose and design." *Id.* at 3226.

While "[t]he machine-or-transformation test may well provide a sufficient basis for evaluating processes similar to those in the Industrial Age," because such inventions are often "grounded in a physical or other tangible form," "there are reasons to doubt whether the test should be the sole criterion for determining the patentability of inventions in the Information Age." *Bilski,* 130 S. Ct. at 3227 (plurality opinion). See also *id.* at 3228 (rejecting argument that "business methods are categorically outside of § 101's scope").

Software is also patent-eligible as a "new and useful improvement" of a "machine." 35 U.S.C. § 101. A software algorithm "creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994) (en banc). In fact, because "a software process is often interchangeable with a hardware circuit," "the line of demarcation between a dedicated circuit and a computer algorithm accomplishing the identical task is frequently blurred and is becoming increasingly so as the technology develops." *Id.* at 1583 (Rader, J., concurring). Software in application creates a new improvement of an existing machine—precisely what Section 101 requires.

The Patent Act is specifically designed to encompass inventions not imagined at the time of its enactment. Denying patent protection for "inventions in areas not contemplated by Congress * * * would frustrate the purposes of the patent law," because "[a] rule that unanticipated inventions are without protection would conflict with the core concept of the patent law that anticipation undermines patentability." *Chakrabarty*, 447 U.S. at 315-316.

B. Software Innovations Are Not Categorically Exempt By The Implied Exceptions To Section 101.

This Court has identified "three specific exceptions to § 101's broad patent-eligibility principles: 'laws of nature, physical phenomena, and abstract ideas.'" *Bilski*, 130 S. Ct. at 3225. These are "'the basic tools of scientific and technological work'" and "monopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it." *Mayo*, 132 S. Ct. at 1293 (quoting *Gottschalk* v. *Benson*, 409 U.S. 63, 67 (1972)).

The Court has warned that "too broad an interpretation" of these implicit exemptions to Section 101 "could eviscerate patent law" because "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Mayo*, 132 S. Ct. at 1293. Thus, "'[w]hile a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.'" *Id.* at 1294 (quoting *Diehr*, 450 U.S. at 188).

There is no serious argument that all software is itself a law of nature or a physical phenomenon. Nor is software inherently an "abstract idea."

The Court held in *Bilski* that an "abstract idea" is a "fundamental * * * practice long prevalent." 130 S. Ct. at 3231 (quotation omitted). It determined that the concept of hedging risk, which is "taught in any introductory finance class," falls within that category. *Ibid.* (quotation omitted). Permitting a patent for that concept would "pre-empt use of this approach in all fields," and "would effectively grant a monopoly over an abstract idea." *Ibid.*

Software is a recent innovation tied to the development of computers, and therefore cannot be categorized as a "fundamental practice long prevalent," akin to risk hedging. And the investment of hundreds of billions of dollars in software development demonstrates why numerous software innovations satisfy Section 101's requirement that a claimed invention be "new and useful." *Bilski*, 130 S. Ct. at 3225.

Those who argue that software should not be patentable contend that all software is an "algorithm," and that all "algorithms" are ineligible for patent protection. That contention is plainly wrong. Many "algorithms" are patent eligible; in fact, *all* process patents qualify as algorithms.

An "algorithm" is "a sequence of instructions that tells how to solve a particular problem," which is "specified exactly" and contains "a finite number of steps." Douglas Downing et. al, Dictionary of Computer & Internet Terms (11th ed. 2013). "An algorithm might be written in a computer program, or it can be a set of instructions for a person to follow." *Ibid.* It can be described in words or represented graphically, such as through a flow chart.

Thus, *any* process with finite and definite steps is an algorithm, or—at the very least—can be written as an algorithm. A parent who posts on the kitchen refrigerator—"If kitchen trash can is full, take to the garage. If garage trash can is full, take to the curb."—has written an algorithm. An "algorithm" is not limited to a mathematical formula; any specified sequence of steps qualifies.

For that reason, virtually every patent-eligible process discloses an algorithm. In *Diehr*, for example, the "claims describe in detail a step-by-step method" for curing rubber; in other words, an algorithm. 450 U.S. at 184. And the *Diehr* Court emphasized that "[i]ndustrial processes such as this are the types which have historically been eligible to receive the protection of our patent laws." *Ibid.* See also *Tilghman* v. *Proctor*, 102 U.S. 707, 722 (1880) ("A manufacturing process is clearly an art, within the meaning of the law.").

Of course, an algorithm *could* implement an "abstract idea." One might write an algorithm, for example, describing the risk hedging at issue in *Bilski* as a series of generalized steps. Likewise, one could write an algorithm disclosing the steps to dose certain medications by measuring metabolites in the blood, a law of nature, as at issue in *Mayo*.

But the fact that an algorithm *can* implement an abstract idea does not mean that *all* algorithms are abstract ideas and thus patent ineligible—any more than the fact that a chemical formula can be used to describe a substance found in nature means that all chemical formulae are ineligible under Section 101. Otherwise, the category of patent-eligible "processes" would be rendered a null set—a result fundamentally at odds with the text of Section 101 and centuries of practice.

Previous uses of the term "algorithm" by this Court confirm the conclusion that only those algorithms describing an abstract idea or law of nature are nonpatentable.

Benson involved a patent that claimed the process of converting binary-coded decimal (BCD) signals into pure binary form. 409 U.S. at 65. The Court viewed this process, which was the application of a "mathematical formula," as "so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion." *Id.* at 68, 71. The formula could be used in applications that "vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents." *Id.* at 68. It was the extraordinarily abstract nature of the claimed process, and the lack of any limitation to a concrete application, that led the Court to reject the claim.

Thus, in finding the claim ineligible the Court explained that "the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." *Benson,* 409 U.S. at 72. That is, the *specific* algorithm at issue in *Benson*—which was defined there as the mathematical formula—was patent ineligible. *Benson* did not hold *all* algorithms patent ineligible.

Next, in *Parker* v. *Flook*, 437 U.S. 584, 585 (1978), the Court considered alarm limits used during catalytic conversions. The process had three steps: measuring certain values (like temperature), calculating these values via a claimed mathematical formula, and updating the alarm-limit that would signal danger or inefficiency. *Id.* at 586. The mathematical formula at issue was "a law of nature" (*id.* at 589), the Court said, because it "reveal[ed] a relationship that has always existed." *Id.* at 593 n.15.

The Court concluded that the "process is unpatentable under § 101, not because it contains a *mathematical* algorithm as one component, but because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention." *Flook*, 437 U.S. at 594 (emphasis added). The Court's holding that the claim was not patentable, accordingly, was based on its conclusion that the particular algorithm was nothing more than the mathematical formula itself.

In *Diehr*, the Court again referred to a mathematical formula, there the Arrhenius equation, as an algorithm. 450 U.S. at 186. Once more, the *particular* algorithm at issue described a "law of nature"—an equation that corresponded to an observable phenomenon. *Ibid.*

Diehr expressly noted that "[t]he term 'algorithm' is subject to a variety of definitions," including the "significantly broader" definition of "'[a] fixed step-by-step procedure for accomplishing a given result.'" 450 U.S. at 186 n.9. The Court emphasized that its earlier decisions in *Benson* and *Flook*, "regarding the patentability of 'algorithms' are necessarily limited to the more narrow definition employed by the Court"—a mathematical formula describing an abstract idea. *Ibid.* The Court, therefore, did "not pass judgment on whether processes falling outside the definition previously used by this Court," but within the broader definition of the term, "would be patentable subject matter." *Ibid.*

Benson, *Flook*, and *Diehr*, accordingly, establish the unexceptional principle that a particular "algorithm" that simply relays a law of nature or an abstract idea is patent-ineligible. But that has no bearing on the patent-eligibility of an "algorithm" that is *not* a law of nature or abstract idea. Rather, when the term "algorithm" is used in the broader sense to describe a step-by-step process of accomplishing a particular result, it is plainly within the scope of Section 101; otherwise every process patent would be invalid.

When software is described categorically as an "algorithm," it is in that broader sense, because software specifies a step-by-step process by which a computer arrives at a particular result. For that reason, software algorithms—which embody a process like any other created by human engineering—are not categorically excluded from Section 101.

C. *Stare Decisis* Precludes A Categorical Bar On Software Patentability.

This Court, the Federal Circuit, and the Federal Circuit's predecessor have consistently held software to be patent eligible. See page 11 & n.3, *supra*. *Stare decisis* therefore precludes any diminution in patent protection for software.

The PTO has issued hundreds of thousands of software patents. Indeed, thirteen years ago, noting that "[w]ith some eighty thousand software patents already issued," leading commentators concluded that "software patentability is a matter for the history books." Cohen & Lemley, 89 Cal. L. Rev. at 4.

Stare decisis has special force in this context because "[f]undamental alterations" in intellectual property "rules risk destroying the legitimate expectations of inventors in their property," and courts therefore "must be cautious before adopting changes that disrupt the settled expectations of the inventing community." *Festo Corp.* v. *Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 739 (2002). "Considerations in favor of *stare decisis* are at their acme in cases involving property and contract rights, where reliance interests are involved." *Pearson* v. *Callahan*, 555 U.S. 223, 233 (2009) (quotation omitted).

The settled expectations of a massive industry, expectations that drive tens of billions of dollars worth of research and development spending each year and support millions of jobs, therefore preclude a decision limiting the patentability of software innovations.

III. Section 101 Serves An Important, But Limited, Screening Function.

Section 101's threshold test is important, but it is not the only legal requirement that a claimed invention must satisfy in order to obtain a patent. Other significant standards play a critical role in guaranteeing patent quality.

The Section 101 test applies to software claims in the same manner the Court has applied it to patent claims in other fields of invention. If the software claim does not involve a law of nature, physical phenomenon, or abstract idea—and the vast majority of software claims do not—Section 101 is satisfied. If the claim does involve such a concept, the next step is to determine whether the claim does "significantly more" than merely describe that law, phenomenon, or idea. *Mayo*, 132 S. Ct. at 1297.[4]

A. Section 101 Need Not And Should Not Incorporate Other Patent Act Requirements.

The content of Section 101's "threshold test" for patent eligibility (*Bilski*, 130 S. Ct. at 3225) is informed by the other significant statutory requirements that a patent applicant must satisfy—and that therefore protect against unjustified patents. Congress's decision to include these requirements makes clear that it did not intend Section 101's "threshold test" to perform all—or even most—of the job of precluding patent grants to ineligible claims. Although these other "inquir[ies] might sometimes overlap" with the Section 101 analysis (*Mayo*, 132 S. Ct. at 1304), "[t]hese limitations serve a critical role in adjusting the tension, ever present in patent law, between stimulating innovation by protecting inventors and impeding progress by granting patents when not justified by the statutory design" (*Bilski*, 130 S. Ct. at 3229).

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[4] Some *amici* urge the Court to adopt a rule *requiring* a district court to address Section 101 issues at the outset of the litigation; others seek a rule *requiring* a court to await claim construction. Compare, *e.g.*, Retailers Br. 6-10 with Ass'n of Bar of New York Br. 19-24. Neither approach is correct, as "the judges of the district courts * * * are in the best position to determine the order of decisionmaking that will best facilitate the fair and efficient disposition of each case." *Pearson*, 555 U.S. at 242.

The Court's reference to Section 101 as a "threshold test" (*Bilski*, 130 S. Ct. at 3225) does not command *when* a court must conduct that analysis. In fact, in *Dann* v. *Johnston*, 425 U.S. 219, 220 (1976), the Court held so expressly: while the parties "presented lengthy arguments addressed to the question of the general patentability of computer programs," the Court concluded that it had "no need to treat that question in this case" because "in any event respondent's system is unpatentable on grounds of obviousness."

First, a patent claim must describe an invention that is "novel." 35 U.S.C. § 102(a). A claim is invalid if it was "patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention." *Ibid*. See also *Bonito Boats, Inc.* v. *Thunder Craft Boats, Inc.*, 489 U.S. 141, 150 (1989).

Second, the claimed invention must be nonobvious. 35 U.S.C. § 103. A claim is not patentable if "the differences between the claimed invention and the prior art" "would have been obvious * * * to a person having ordinary skill in the art to which the claimed invention pertains." *Ibid*. See also *KSR Int'l Co.* v. *Teleflex Inc.*, 550 U.S. 398, 406 (2007).

Third, the patent must fully and particularly describe the claimed invention. 35 U.S.C. § 112. Disclosing to the world one's innovation "is the *quid pro quo* of the right to exclude." *J.E.M. Ag Supply,* 534 U.S. at 142 (quotation omitted).

This requires an inventor to provide "a written description of the invention" that would "enable any person skilled in the art to which it pertains * * * to make and use the same." 35 U.S.C. § 112(a). The description must also "set forth the best mode contemplated by the inventor * * * of carrying out the invention." *Ibid.* The claims must be sufficiently definite; they must "particularly point[] out and distinctly claim[] the subject matter which the inventor or a joint inventor regards as the invention." *Id.* § 112(b). And an inventor cannot merely claim the purported functions of an invention; the patent must disclose "a means or step for performing a specified function." *Id.* § 112(f). See also *Halliburton Oil Well Cementing Co.* v. *Walker*, 329 U.S. 1, 12 (1946) (noting "the broadness, ambiguity, and overhanging threat of the functional claim").

The PTO recently issued formal regulations that underscore the importance of Section 112. See *Supplementary Examination Guidelines for Determining Compliance with 35 U.S.C. § 112 and for Treatment of Related Issues in Patent Applications*, 76 Fed. Reg. 7162 (Feb. 9, 2011). The guidance emphasizes that claims must be sufficiently definite (*id.* at 7163-7167), and—particularly with respect to software patents—that claims may not assert a function without disclosing the means of accomplishing that function (*id.* at 7167-7168). In the context of software, to satisfy Section 112, a patent generally must disclose a sufficiently specific algorithm to accomplish the claimed function. *Id.* at 7168. A year after issuing this guidance, the PTO reported that "examiners were making 4 to 6 percent more rejections in patent applications across all technology areas" based on Section 112. GAO, *Intellectual Property*, *supra*, at 40.

Section 112 has proven an effective mechanism for invalidating low-quality software patents that do not adequately disclose a means for implementing the claimed function. See, *e.g.*, *Blackboard, Inc.* v. *Desire2Learn, Inc.*, 574 F.3d 1371, 1385 (Fed. Cir.

2009); *Aristocrat Techs. Australia Pty Ltd.* v. *Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008); *Finisar Corp.* v. *DirecTV Grp., Inc.*, 523 F.3d 1323, 1340-1241 (Fed. Cir. 2008) ("Simply reciting 'software' without providing some detail about the means to accomplish the function is not enough.").

Section 112, accordingly, weeds out overbroad, ambiguous, or un-enabled claims, or claims that fail to set forth the best mode or that fail to disclose a means to accomplish a claimed function.[5]

These three standards, with their carefully-calibrated standards grounded in express statutory language, provide significant protections against unjustified patent grants.

B. Section 101's Standards Apply To Software Claims In The Same Manner As Claimed Inventions In Other Fields Of Endeavor.

A *particular* claimed software invention—like a particular claimed invention of any other type—may be ineligible under Section 101. *Cf. Ass'n for Molecular Pathology* v. *Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2119 (2013) (holding "cDNA sequence" which "is not naturally occurring" is patent eligible, while a naturally-occurring DNA sequence is *not* patent eligible).

Section 101's implicit exclusions apply to software claims in the same manner that the Court has applied them to other innovations. The Court's Section 101 jurisprudence provides two critical guideposts.

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[5] The Court is well aware of the importance of Section 112, having recently granted certiorari in *Nautilus, Inc.* v. *Biosig Instruments, Inc.*, No. 13-369.

First, a significant majority of software claims are unrelated to a law of nature, physical phenomenon, or abstract idea. These claims are eligible for patent protection under Section 101 without further inquiry.

Second, a software claim that *does* implement a law of nature, physical phenomenon, or abstract idea is eligible for patent protection if it does "significantly more" than, in general terms, claim the application of that concept on a computer. But the prohibition on patenting a law of nature or abstract idea cannot be circumvented by merely claiming to apply that law or idea "on a computer"—such claims are excluded by Section 101.

1. A Software Algorithm Unrelated To A Law Of Nature, Physical Phenomenon, Or Abstract Idea Is Necessarily Eligible For Patent Protection Under Section 101.

The software patent claims in this case—like those that have received the lion's share of judicial attention—are *atypical* of software innovations generally. Most software claims do not merely implement on a computer an abstract concept or law of nature that pre-dated computers or exists apart from them. That is, unlike this case, most claims do not simply claim "an abstract idea implemented on a computer." The typical software claim instead involves innovations that are unique to the digital world itself.

Following are only a few examples of the tens of thousands of such software inventions.

Computer functionality:

- *Lempel-Ziv-Welch data compression*: A lossless data compression software that reduces a text file to about half its original size, which was critical for the development of computer networking. The patent discloses very specific algorithms controlling the manipulation of digital data. U.S. Pat. Nos. 4,464,650 & 4,814,746.
- *RSA security token*: A cryptology software program that provides secure online communications. These claims also disclosed substantially complex and specific algorithms governing the claimed process. U.S. Pat. No. 4,405,829.
- *Philips multiplexing*: A software system that permits more efficient transmission of digital video content; it is broadly used in a variety of applications, including online videos and DVDs. This software makes possible streaming of online content. U.S. Pat. No. 5,333,135.

Telecommunications:

- *Qualcomm CDMA technology*: Code Division Multiple Access is used by most U.S. cell phones to allow multiple users to share the same frequencies. This technology is critical to efficient cellular networks. U.S. Pat. Nos. 5,103,459, 5,101,501, 5,109,390, & 5,056,109.

Digital Imagery:

- *Adobe Photoshop's "healing brush" feature*: A software process that permits a user to quickly manipulate a digital photo by removing unwanted blemishes. U.S. Pat. No. 6,587,592.

Entertainment:

- *10NES*: A software system designed by Nintendo that ensures only authentic, authorized games may be played on a Nintendo game console. U.S. Pat. No. 4,799,635.
- *Microsoft Kinect gesture recognition and skeletal tracking*: Software that creates a means for tracking human gestures as an input mechanism for computers. In addition to entertainment, this technology provides assistive technologies for people with disabilities, creates more engaging educational tools for children, and helps doctors during surgeries. U.S. Pat. Nos. 7,974,443 and 7,996,793.

None of these claims implements an abstract idea, law of nature, or physical phenomenon; instead, they are tethered to innovations specific to the digital world. In these circumstances—which describe a huge percentage of software patents—no further analysis under Section 101 is required to determine that the claim is patent-*eligible*.

2. *A Software Claim That Does Implement A Law Of Nature, Physical Phenomenon, Or Abstract Idea Is Patent Eligible If It Does "Significantly More" Than Describe The Patent-Ineligible Concept.*

Some software claims, however, *do* implement laws of nature, physical phenomena, or abstract ideas via a computer. When such a software claim does "significantly more" than claim all computer implementation of that concept, the claim is eligible for patent protection. *Mayo*, 132 S. Ct. at 1297. "[A] process is not unpatentable simply because it contains a law of nature" (*Flook*, 437 U.S. at 590); an "*application of*" an "unpatentable" concept may "transform" it into something patent-eligible. *Mayo*, 132 S. Ct. at 1294.

Diehr illustrates this principle at work. There, the claim used, in part, Arrhenius' equation to determine the length of time rubber products should remain in curing molds. 450 U.S. at 187-188. The claim would not "pre-empt the use of that equation" in other contexts; it only would "foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process." *Id.* at 187. And there were several significant steps other than applying the equation. *Ibid.*

Accordingly, while "Arrhenius' equation is not patentable in isolation," "when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by § 101." *Diehr*, 450 U.S. at 188. The process, which in part involved a computer innovation, was patentable because it applied the Arrhenius equation to solve a real, practical, and limited problem.

If, on the other hand, the patent application simply tacks an extremely general computer limitation to an abstract idea or law of nature—without anything more—it is not patent-eligible. One cannot take a concept that exists outside of the digital environment and that, standing alone, would not qualify as patent eligible subject matter, and transform it into a patentable eligible innovation simply by claiming generally to "apply it" via a computer. *Cf. Mayo*, 132 S. Ct. at 1294.

As this Court made clear, "Einstein could not patent his celebrated law that $E=mc^2$." *Mayo*, 132 S. Ct. at 1293. Nor could he "have patented his famous law by claiming a process consisting of simply telling linear accelerator operators to refer to the law to determine how much energy an amount of mass has produced." *Id.* at 1297. Nor can that formula be patented by directing one to "compute it."

That conclusion results from the principle that meaningless limitations cannot transform a law of nature, physical phenomenon, or abstract idea into something that is patent eligible. Such meaningless limitations include specifying a "particular technological environment" (*Bilski*, 130 S. Ct. at 3230), adding "insignificant postsolution activity" (*ibid.*), or describing "well-understood, routine, [or] conventional activity" (*Mayo*, 132 S. Ct. at 1294).

A mere limitation to "apply" a patent-ineligible concept "on a computer," is a field-of-use limitation, postsolution activity, *and* conventional. Thus, claiming in generalized terms a computer limitation does not, by itself, transform a patent-ineligible concept into something that qualifies under Section 101.[6]

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[6] This is the approach that the plurality opinion took below. Pet. App. 28a. And the Federal Circuit has often concluded that software patent claims are excluded by Section 101 when they couple a generalized computer-implementation limitation with an abstract idea. See, *e.g.*, *SmartGene, Inc.* v. *Advanced Biological Labs., SA*, 2014 WL 259824 (Fed. Cir. 2014); *Accenture Global Servs., GmbH* v. *Guidewire Software, Inc.*, 728 F.3d 1336, 1344 (Fed. Cir. 2013); *Bancorp Servs., L.L.C.* v. *Sun Life Assur. Co.*, 687 F.3d 1266, 1278 (Fed. Cir. 2012); *Fort Props., Inc.* v. *Am. Master Lease LLC*, 671 F.3d 1317, 1323-1324 (Fed. Cir. 2012); *Dealertrack, Inc.* v. *Huber*, 674 F.3d 1315, 1333-1334 (Fed. Cir. 2012); *Cyber-*

IV. The Claims In This Case Are Not Patent Eligible.

This is a straightforward case for applying Section 101. The claims here do not assert a process accomplishing something unique to a digital environment. Instead, they merely purport to take an abstract business method—the abstract idea of intermediated settlement—and "apply it" on a computer.

The claims do not contain limits that would transform the abstract idea into a practical, patent-eligible application. Rejecting these claims, which are effectively "the *Bilski* claims on a computer," says nothing at all about the patentability of the real software innovations that power the Information Age.

A. Intermediated Settlement Is An Abstract Idea.

Petitioner's claims implement the concept of intermediated settlement. This is a "fundamental * * * practice," understood for centuries, if not millennia, and no different than the practice of risk hedging. *Bilski*, 130 S. Ct. at 3231. It is thus an "abstract idea." *Ibid.*

This is not a controversial proposition: nine of the ten members of the *en banc* agreed so expressly. The five-judge plurality, authored by Judge Lourie, noted that the patent claims "draw on the abstract idea of reducing settlement risk by effecting trades through a third-party intermediary." Pet. App. 28a. Judges Rader and Moore (*id.* at 82a) as well as Judges Linn and O'Malley (*id.* at 124a) agreed.

Source Corp. v. *Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011).

Petitioner in this Court substantially revises its argument that intermediated settlement is not an abstract idea. Seizing the statement in *Bilski* that risk hedging could be "reduced to a mathematical formula," petitioner argues that an "abstract idea" is *only* "[a] fundamental truth in the sense of a mathematical formula [that] reveals a relationship that has always existed." Pet. Br. 22 (quotation omitted). Petitioner suggests that the court below has improperly conflated "disembodied concept[s]" with "abstract ideas." *Id.* at 27. Petitioner ultimately contends that because its claims do not recite "mathematical formulas and the like," they do not state an abstract idea at all. See *id.* at 21-29, 44-46.

Petitioner's argument is wrong for at least two reasons: this Court's decisions require rejection of the contention that abstract ideas are limited to "fundamental truths," and many abstract ideas cannot be reduced to mathematical formulae.

First, *Bilski* held that "the basic concept of hedging" constituted an "abstract idea" because it was a "fundamental economic practice[s] long prevalent in our system of commerce and taught in any introductory finance class." 130 S. Ct. at 3231 (quotation omitted). But risk hedging is not a naturally occurring phenomena that humans one day observed; it is a concept that, at some point millennia ago, humans devised. *Ibid.* *Bilski* thus establishes that the category of unpatentable abstract ideas is not limited to "fundamental truths" that have "always existed." Under petitioner's theory, by contrast, *Bilski* was wrongly decided.

Petitioner's theory is also foreclosed by *O'Reilly* v. *Morse*, 56 U.S. 62, 113 (1853). In famously barring Samuel Morse from patenting the use of "electromagnetism, however developed" for sending signals "at any distances," the Court explained that this was merely an effort to patent a concept. *Id.* at 112-113. The Court drew a hypothetical involving steam-powered transportation: "No one, we suppose will maintain that Fulton could have taken out a patent for his invention of propelling vessels by steam, describing the process and machinery he used, and claimed under it the exclusive right to use the motive power of steam, however developed, for the purpose of propelling vessels." *Id.* at 113.

Morse thus made clear that one cannot patent the mere concept of using a steam engine to power transportation. But such a concept, just like risk hedging, is hardly a "fundamental truth" that reveals some "relationship that has always existed." Pet. Br. 22 (quotation omitted). It is an abstract idea created by humans, but nonetheless ineligible for patent protection.[7]

Second, some unpatentable abstract ideas are not reducible to a mathematical formula. There is no shortage of abstract concepts that have existed for millennia and are ineligible for patent protection, but that are not reducible to some mathematical formula.

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[7] Petitioner argues it would make "little sense" if an "abstract idea" implicitly exempt from Section 101 could be in the form of a "pure mental conception" because such a concept, "standing alone, does not fall within any of the four statutory categories" of Section 101. Pet. Br. 27-28. But, as the Court held more than a century ago, a "process" may be eligible for patent protection even if it is "a conception of the mind, seen only by its effects when being executed or performed." *Tilghman*, 102 U.S. at 728. Moreover, any abstract idea could be written as a process claim to perform that abstract idea, with nothing more; Section 101 bars such a patent.

For example, the concept of "money" is an abstract idea; one could not patent the idea of using coins, banknotes, or the like as a medium of exchange. But the idea of "money" is not reducible to a mathematical formula. "Advertising" is an abstract idea. The idea of "credit" is abstract; so too is "trusteeship." One could not patent these concepts, nor countless others, as such. (Of course, novel and limited *applications* will qualify as patent-eligible.)

Petitioner contends that the lower court erred by stripping the concept "from any real-world application," because its claim provided the application. Pet Br. 46-47 (quotation and emphasis omitted). But this point has no bearing on whether intermediated settlement is an abstract concept. Because it is, the Court must next ask, "What else is there in the claims before us?" *Mayo*, 132 S. Ct. at 1297. The answer here is clear: nothing.

B. The Patents Contain No Other Meaningful Limitations.

Because petitioner's claim involves computer-implementation of an abstract idea, the next step of the Section 101 analysis is to determine whether the claim "in practice amounts to significantly more than a patent upon" the abstract idea. *Mayo*, 132 S. Ct. at 1294. Petitioner's claims here do nothing more than claim intermediated settlement implemented in any manner on a computer.[8] This is not enough to transform the abstract idea into a patent-eligible claim.

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[8] Petitioner's method claims do not even require, on their face, the use of a computer. See, *e.g.*, JA 383-384. Although

In fact, petitioner does not even attempt to disguise that this is all its claims do. It says the relevant claim limitation is "requiring computer implementation," and that the innovation it asserts is that the "computer *is itself the intermediary*." Pet. Br. 48. But taking an abstract idea, saying "apply it on a computer," and adding nothing more is not enough to overcome the implicit exceptions to Section 101. See pages 27-29, *supra*.

Petitioner contends that the claims "include steps or elements other than those necessary to any use of the idea." Pet. Br. 49. But all these steps do is recite how one can implement intermediated settlement. This is no different than *Mayo*, where the patentee provided a series of steps that, because "[a]nyone who wants to make use of these laws must" perform them, the asserted "combination amounts to nothing significantly more than an instruction to doctors to apply the applicable laws when treating their patients." 132 S. Ct. at 1298.

Seven judges below endorsed this conclusion in analyzing petitioner's process claim. The plurality succinctly summarized the purported limitations and correctly found that "[n]one of those limitations adds anything of substance to the claim." Pet. App. 29a. Judges Rader and Moore likewise concluded that "each step individually recites merely a general step inherent within the concept of an escrow." *Id.* at 83a.

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the parties below agreed that there is an implicit computer limitation arising from the specification (Pet. App. 27a-28a), the fact that a computer is not even disclosed in several of the asserted claims underscores that this is just an abstract business method dressed up as software.

C. The Form Of The Claims Does Not Alter The Result.

Finally, the form of the patent claim has no bearing. As is typically the case of software-related innovations, petitioner holds three different kinds of claims: method claims (which direct a particular process to be accomplished via software, often via an algorithm), system claims (which disclose certain kinds of computer hardware that would be used to perform a process), and media claims (which are computer data storage devices programmed with software code, sometimes referred to as "*Beauregard* claims"). Pet. Br. 6-10.

This Court has repeatedly made clear that application of Section 101 cannot "depend simply on the draftsman's art." *Mayo*, 132 S. Ct. at 1294; *Flook*, 437 U.S. at 593. Because method claims, system claims, and media claims are functionally equivalent—"it is often a straightforward exercise to translate a method claim into system form, and vice versa" (Pet. App. 36a)—there is no basis to consider these claims separately.

Eight members of the court below concluded that the form of the claim has no bearing on its eligibility for patent protection under Section 101. Pet. App. 3a n.1. The plurality noted that the media claims, for example, "are merely method claims in the guise of a device." *Id.* at 34a. Judges Linn and O'Malley (*id.* at 123a) as well as Judge Newman (*id.* at 102a) agreed.

Petitioner hardly disputes this point. It says nothing at all about its media claim. As to its system claims, petitioner argues that, even assuming intermediated settlement is an abstract idea, the system claims are patent-eligible because they "recite specific hardware, configured to perform the specific computerized functions." Pet. Br. 53. But the computer hardware devices it discloses—which includes "a data storage unit" and a "computer" (Pet. App. 35a)—are in no way "specific." Those devices are so general (indeed they describe any off-the-shelf personal computers) that the effect would be to preempt *every* computer implementation of the idea.

Under petitioner's view, therefore, a system claim that provides a process to calculate $E=mc^2$, coupled with disclosure of a device called a "computer," would be enough to patent the concept. But this would amount to an astounding circumvention of Section 101, permitting a party to patent *any* law of nature, physical phenomena, or abstract idea via computer implementation, so long as rote, meaningless formalities—*i.e.*, saying one must use a "computer"—are attached.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

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Petitioner,

v.

CLS BANK INTERNATIONAL, ET AL.,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICI CURIAE* CHECKPOINT SOFTWARE, INC., COLLATERAL ANALYTICS, LLC, DAILY MOTION, INC., GITHUB, INC., GUIDEWIRE SOFTWARE, INC., HIPMUNK, INC., JIVE SOFTWARE, INC., LINKEDIN, INC., MESSAGE SYSTEMS, INC., NETFLIX, INC., NEWEGG, INC., QUANTUM CORPORATION, RACKSPACE, INC., RING CENTRAL, INC., TRULIA, INC., TWITTER, INC., AND YELP INC. IN SUPPORT OF RESPONDENTS

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INTEREST OF THE AMICI CURIAE[1]

Amici are small and medium-sized companies that develop and sell software and a variety of products that use and incorporate software. Amici are among the most innovative and fastest-growing companies in the world, and collectively own many software patents. Amici have no direct interest in the outcome of this case, but have a strong interest in seeing that the patent system encourages, and does not impede, innovation.

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[1] Counsel for the parties have filed blanket consents to the filing of amicus briefs. Pursuant to Rule 37.6, no counsel for either party had any role in authoring this brief in whole or in part, and no party other than the named Amici has made any monetary contribution toward the preparation and submission of this brief.

SUMMARY OF ARGUMENT

Software patents do not serve the Constitutional purpose of the patent system: to promote the progress of science and the useful arts. Software companies, including the undersigned, do not innovate in hopes of obtaining software patents. Rather, we create innovative software because of our desire to delight our customers and despite, not because of, the patent system.

Amici take no position in this brief on what the law of patentable subject matter requires, or on whether software should be patentable. But some have suggested to this Court that software patents are necessary to support innovation. They are not. The undersigned believe that innovation happens despite software patents, not because of them.

ARGUMENT

I. Software Patents Are Not Necessary to Drive Innovation

Software patents are not necessary to spur innovation among the Amici. Our engineers do not innovate because they hope to get patents. To the contrary, our programmers (like programmers generally) overwhelmingly oppose software patents.[2] "Surveys regularly find that computer programmers are opposed to patents on software by a wide margin." James Bessen & Michael J. Meurer, *Patent Failure: How Judges, Lawyers, and Bureaucrats Put Innovation at Risk* (2008). One early study found that "[b]y lopsided margins ranging from over 2-to-1 to more than 10-to-1, the software developers said that software patents . . . impede software development and should be abolished." David A. Burton, *Software Developers Want Changes in Patent and Copyright Law*, 2 Mich. Telecom. Tech. L. Rev. 87 (1996), *available at* http://www.mttlr.org/voltwo/burton_art.html.

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[2] *See, e.g.*, Robert E. Purvy, *Software Obviousness: The Disconnect Between Engineers and the Patent System* at 1 (2014), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2399580 ("Software engineers overwhelmingly dislike software patents and consider nearly all of them obvious.").

Indeed, companies such as Twitter have begun to compete for engineering talent by offering to restrict offensive patenting, making their patents difficult for patent trolls to use or enforce in court. *See, e.g.*, Adam Messinger, *Introducing the Innovator's Patent Agreement*, Twitter Engineering Blog, (Apr. 17, 2012), *at* https://blog.twitter.com/2012/introducing-innovators-patent-agreement. The fact that companies are competing for inventors by promising to reduce this type of patenting suggests that software patents do not motivate those inventors.

Nor do software patents serve the goal of financing innovation. Our investors do not invest with the hopes of acquiring patents, but with the hope of creating successful products. Product life cycles move very quickly in software. Software patents, by contrast, take over three years on average to issue, *see* Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905, 930, and are often enforced years after that issuance. Thus, by the time a software patent issues – and certainly by the time it is enforced – it is likely to be directed at obsolete technology. This obsolescence causes many of the problems frequently seen in software patent litigation, including the fact that software patent litigation often involves efforts to read vague, functional claim language onto features and functions that did not exist at the time the patent application was filed. This dynamic also means that patents are singularly ineffective at protecting software products from competitors and therefore do not serve as a substantial driver of innovation in the software industry.

Instead, a variety of non-patent incentives spur innovation in the software industry. First-mover advantages can provide substantial rewards to innovators by giving them a jump on the market, leaving imitators scrambling to catch up. Network effects may allow innovators to capture significant returns because the value of the software often increases with the number of users, and thus users want to use the program that everyone else is using. The entire open-source ecosystem exists despite patents because its programmers strive for personal satisfaction, reputation, and a desire to solve a problem. *See, e.g.*, Karim R. Lakhani & Robert G. Wolf, Why Hackers Do What They Do: Understanding Motivation and Effort in Free/Open Source Software Projects, in *Perspectives on Free and Open Source Software* 3, 11-12 (Joseph Feller et al., eds. 2005). Amici and other companies benefit by employing those programmers to build and improve their products. *See* Josh Lerner et al., *The Dynamics of Open Source Contributors*, 96 Am. Econ. Rev. 114, 115 (2006). And both trade-secret and copyright law already protect software and effectively prevent both wrongful use and explicit copying by others. 17 U.S.C. § 101. Thus, inventors and investors who care about maximizing their profits do not necessarily need the incentives theoretically provided by patents.

Software patents, then, serve at most as a sort of consolation prize, giving unsuccessful innovators a chance at recovering some portion of their investment years later. But investors invest in new companies and technologies because they hope to be successful – not because they hope to use software patents to extract royalties from more successful enterprises in the event of failure. To put it differently, inventors and investors are motivated by the hope of success – not by the prospect that they might (through litigation) recoup some portion of their investment in the event of failure. And software patents do not contribute to achieving success for most software companies.

II. Software Patents Hinder Innovation

Patent law tends to hinder rather than spur innovation in the software industry. The many flaws with software patents create a well-known patent thicket that discourages inventors and companies from investing in new research, development, and products.

Software patents are problematic because of the uncertainty associated with the meaning and scope of their claims, which are often drafted in functional language and without a shared vocabulary. Accordingly, it is often impossible to know what a software patent covers until after a court has construed the patent's claims and the parties have spent months on litigation. Even worse, patentees can often benefit from ambiguous patent claims by twisting the language of the patent claim to cover something the inventor did not have in mind at the time.[3] Indeed, because computer technology changes so quickly, and it takes more than three years to get a patent out of the PTO on average, software patents are almost always asserted against technology that is several product generations removed from the patentee's invention, compounding the problem of trying to understand the scope of software patents.

Software patents are often phrased to claim high-level, functional ideas. But an idea is only a small part of a successful software program. Wendy Seltzer, *Software Patents and/or Software Development*, 78 Brooklyn L. Rev. 929, 949 (2013) ("Software developers treat as commonplace the proposition that the idea is only a small part of the final product. . . . It is the implementation that remains difficult and time-consuming."). Successful software companies implement that idea, developing the functioning software in an iterative process that results in constant improvement to the code. As Wendy Seltzer puts it, "[i]nstead of inducing optimal development of innovative software, the rules of the patent system encourage the production of patents." *Id.* at 943.

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[3] Although much of the broad, functional, and ambiguous claim language should be eliminated by a patent examiner during prosecution of the patent, that is often not the case. *See* Lemley, *Software Patents and the Return of Functional Claiming*, *supra* (documenting the widespread use of broad functional claims in software patents).

These problems are compounded by the large number of software patents. Estimates vary widely, in part because it is hard to define a software patent, but there are certainly hundreds of thousands of them, many covering trivial variations of routine functionality. But because computer products – as opposed to patents – inevitably integrate complex, multicomponent technology, any given product is potentially subject to a large number of patents. For example, 3G wireless technology was subject to more than 7,000 claimed "essential" patents as of 2004; that number is doubtless much higher now. *See* Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex. L. Rev. 1991, 2028-29 (2007). WiFi is subject to hundreds and probably thousands of claimed essential patents. *See* Ed Sutherland, *WiMax, 802.11n Renew Patent Debate*, WiFi Planet (Apr. 7, 2005), http://www.wi-fiplanet.com/columns/article.php/3495951. And the problem is even worse than these numbers suggest, since both 3G wireless technology and WiFi are not themselves products but merely components that must be integrated into a final product. Some industry experts have estimated that 250,000 patents go into a modern smartphone. David Drummond, *When Patents Attack Android*, Google: Official Blog (Aug. 3, 2011), http://googleblog.blogspot.com/2011/08/when-patents-attack-android.html (statement of David Drummond, Chief Legal Officer at Google). The result is what Carl Shapiro has called a "patent thicket" — an overwhelming set of overlapping patent rights that impede innovation. *See* Carl Shapiro, *Navigating the Patent Thicket: Cross*

Licenses, Patent Pools, and Standard Setting, 1 Innovation Pol'y & Econ. 119, 120 (2000). *See also* Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 Sci. 698 (1998).

Further, many asserted software patents are invalid. Empirical evidence suggests that nearly half of all asserted patents are invalid, John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 205 (1998) (forty-six percent of litigated patent claims invalid), and software patents appear (to the Amici) to be more likely than most to be invalid. Thus, even if an innovative, product-producing software company acting in good faith could identify the thousands of patents that might be held to read on its product, any effort to license those patents would have to involve paying for thousands of invalid patents.

It is no wonder that "[s]oftware developers do not perform patent searches before developing products." Seltzer, *supra*, at 955. Indeed, research suggests that companies in the software industry largely ignore patents unless and until they are threatened with suit – and that this behavior is economically rational. *See* Mark A. Lemley, *Ignoring Patents*, 2008 Mich. St. L. Rev. 19, 21-22. The fact that we have created a system in which it makes no sense to read software patents undermines the disclosure benefit long thought to be at the heart of the patent system.

It also encourages litigation. Indeed, it is virtually certain that if a software product is successful, its maker can expect to be hit with dozens of suits and receive hundreds of threat letters from patent owners.[4] These lawsuits are expensive, draining resources that would otherwise be put towards innovation. They are also socially costly. According to one estimate, patent trolls cost the economy $500 billion over the last twenty years, mostly in the information technology industry. James E. Bessen et al., *The Private and Social Costs of Patent Trolls* at 17 (Boston Univ. Sch. of Law, Working Paper No. 11-45, 2011), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272. Elsewhere, the same authors find that patents in the information technology industry have a net negative effect on the market value of companies in the industry. Bessen & Meurer, *Patent Failure*, *supra*, at 137. Other reports suggest that patent trolls inhibit innovation at the firms they sue.

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[4] To take just a few examples, Lex Machina data shows that as of May 1, 2012, Apple had been named in 298 patent lawsuits over the last dozen years, Microsoft in 269 patent lawsuits, Google in 151, Yahoo! in 91, Oracle in 58, Facebook in 56, SAP in 38, Yelp in 9, and Twitter in 8. Lex Machina, http://www.lexmachina.com. While some of these companies, notably Apple and Oracle, are plaintiffs in some suits, the overwhelming majority of these cases involve the named companies as patent infringement defendants, and the majority are filed by patent trolls.

Catherine Tucker, *Patent Trolls and Technology Diffusion* at 4 (Tilburg Law & Econ. Ctr., Discussion Paper No. 2012-030), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1976593. That is a far cry from what the patent system is supposed to do: encourage innovation.

CONCLUSION

We do not express an opinion on what the law of patentable subject matter requires. Nor do we suggest that patents could never be appropriate for software. But the software patent system as it is currently designed does not promote innovation, but rather hinders it.

Respectfully submitted,

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Petitioner,
v.
CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

**On Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit**

BRIEF OF THE CLEARING HOUSE ASSOCIATION L.L.C. AND FINANCIAL SERVICES ROUNDTABLE AS AMICI CURIAE IN SUPPORT OF RESPONDENTS

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INTEREST OF AMICI CURIAE*

The Clearing House Association L.L.C. is the oldest banking association in the United States, and is owned by the world's largest commercial banks, which collectively hold more than half of all U.S. deposits. The Clearing House clears more than $2 trillion per day across its networks. The Financial Services Roundtable represents 100 integrated financial services companies providing banking, insurance, and investment products and services to the American consumer.

Amici and their members share grave concerns about the many computer-aided business method patents granted following the Federal Circuit's decision in *State Street Bank & Trust Co. v. Signature Financial Group*, 149 F.3d 1368 (Fed. Cir. 1998). Those patents are especially prevalent and problematic in the banking industry, where longstanding practices are increasingly being claimed as patent-eligible business methods, based solely on the integration of a computer.

As the numerous disparate opinions in the en banc proceedings below illustrate, different judges on the Federal Circuit have vastly different views as to which which computer-aided processes are patent-eligible under 35 U.S.C. § 101 and which are not, and what this Court's precedents require in terms of the analysis under that statute.

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* Petitioner and Respondents have consented to the filing of this brief in separate letters filed with the Clerk on December 11, 2013. No counsel for a party authored this brief in whole or in part. No one other than amici curiae, their members, or their counsel made any monetary contribution intended to fund the preparation or submission of this brief.

Amici's members hold patents of their own and are accused of infringing patents. Uncertainty over whether computer-aided processes are patent eligible prevents amici's members from accurately gauging the value or enforceability of their intellectual property, and also leaves them unsure whether they can offer certain products or services without infringing others' patents.

This double-sided uncertainty is detrimental to the basic functioning of the banking industry. It hinders competition and innovation by discouraging industry members from developing new products and services, provides poor notice of the extent of patent holders' intellectual property rights, and prevents amici's members from accurately determining their assets and liabilities. These factors lead to costly and wasteful litigation as parties resort to the federal courts to determine which patents do and do not claim patent-eligible subject matter. The prevailing uncertainty regarding patent eligibility also encourages speculative litigation, as plaintiffs exploit increased uncertainty over trial outcomes to obtain larger settlements.

For these reasons, amici ask the Court to take the opportunity this case presents to reaffirm the significance of patent eligibility under 35 U.S.C. § 101 as a threshold test of patent validity, to clarify when the integration of a computer into an otherwise patent-ineligible process renders that process patent-eligible, and to affirm the judgment below.

INTRODUCTION AND SUMMARY OF THE ARGUMENT

As CLS's brief well explains, the unpatentability of Alice's claims under 35 U.S.C. § 101 should follow as a straightforward matter from *Bilski v. Kappos*, 130 S. Ct. 3218 (2010) and *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012). The numerous Federal Circuit opinions in this case show that the judges of the Federal Circuit continue to disagree among themselves about fundamental aspects of 35 U.S.C. § 101's test for patent eligibility, particularly as applied to computer-implemented patent claims. In resolving this case, the Court should address two areas of disagreement at the core of the Federal Circuit's treatment of the merits of this case.

First, the Court should reaffirm that Section 101 is a substantive, threshold test of patentability that should be assessed early in litigation. The Court should thus reject the contrary notion, espoused in an aberrant line of Federal Circuit cases, that Section 101 is a "coarse eligibility" filter test that should be avoided where possible and should be considered satisfied unless it is manifestly evident that the test is not satisfied.

Second, the Court should provide further guidance as to when the addition of a computer makes an otherwise patent-ineligible process eligible under Section 101. The Court should hold—consistent with this Court's and the Federal Circuit's specific precedent addressing computer-implemented patent claims—that the addition of a computer to an otherwise patent-ineligible mental process does not transform that process into a patent-eligible invention unless the integration of the recited computer is essential to performing the claimed process, and not merely used to make the process easier, cheaper, or more efficient to perform.

The widespread adoption and integration of computers has permitted a level of automation, convenience, and efficiency that would have been unimaginable only a few decades ago. But the extensive use of computers to perform or assist in tasks that were previously performed mentally or manually has raised a difficult issue for patent law. Section 101 of the Patent Act provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. For more than 150 years, this Court has held that, although this standard for patent eligibility is broad, abstract ideas, mental processes, laws of nature, and physical phenomena are not patentable. *Bilski*, 130 S. Ct. at 3225 (citing *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 174-75 (1853)); *see also Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972). It is not always clear, however, when the addition of a computer makes an otherwise patent-ineligible process eligible under Section 101.

At the most basic level, computers are only automated machines that execute a predetermined series of mathematical or logical operations. *See Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of*

Canada, 687 F.3d 1266, 1277–78 (Fed. Cir. 2012), *cert pet. filed*, No. 13-584 (Nov. 8, 2013). Thus, a human being with unlimited time could execute exactly the same operations in exactly the same manner as the computer and achieve exactly the same result. This is obvious for simple tasks; a person can sit down with paper and pencil and perform exactly the same arithmetic processes as can be performed on a calculator. But the same logic applies to more complicated tasks: a person with unlimited time and capacity and perfect precision could perform even the most complicated processes using only their own mind.

Mental processes are fundamentally not patent eligible under Section 101 because "computational methods which can be performed *entirely* in the human mind are the types of methods that embody the 'basic tools of scientific and technological work' that are free to all men and reserved exclusively to none." *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) (quoting *Benson*, 409 U.S. at 67) (original emphasis). "[M]onopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it." *Mayo*, 132 S. Ct. at 1293. Thus, Section 101 performs a vital threshold function, especially in the context of computer-aided business method patents, by screening out patent claims that attempt to monopolize patent-ineligible mental processes. *See, e.g.*, *Parker v. Flook*, 437 U.S. 584, 593 (1978). Here, Alice has attempted to monopolize the patent-ineligible basic concept of escrow, and its claims are thus ineligible for patenting under Section 101, as that statute is properly applied.

ARGUMENT

I. Section 101 Establishes an Essential Threshold Requirement for Patent Eligibility.

To restore some measure of clarity to the doctrine of patent-eligibility, the Court should reaffirm that 35 U.S.C. § 101 is a substantive threshold test of patentability, and as such should be enforced rigorously and assessed early in litigation. The inquiry is not—as an erroneous strain of Federal Circuit caselaw holds—a nonsubstantive "coarse eligibility filter" that should be read narrowly and deemed satisfied unless it is "manifestly evident" that the test is not satisfied.[2] The "coarse eligibility filter" concept was the basis of the panel opinion below. *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341, 1352 (Fed. Cir. 2012). That line of cases disregards two consistent features of this Court's precedents addressing Section 101.

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[2] *See Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir. 2010); *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057, 1066-67 (Fed. Cir. 2011); *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1326 (Fed. Cir. 2011), *vacated and remanded sub nom. WildTangent Inc. v. Ultramercial LLC*, 132 S. Ct. 2431 (2012); *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1261 (Fed. Cir. 2012); *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1331 (Fed. Cir. 2012); *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341, 1352 (Fed. Cir. 2012); *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1326 (Fed. Cir. 2013) (en banc) (Rader, C.J., "additional views"); *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013), *cert pet. filed*, No. 13-255 (Aug. 23, 2013).

First, Section 101 is a "threshold test" of patentability that should generally be considered *before* other issues, such as claim construction or obviousness. *Flook* explained that "the rule that the discovery of a law of nature cannot be patented rests, not on the notion that natural phenomena are not processes, but rather on the more fundamental understanding that they are not the kind of 'discoveries' that the statute was enacted to protect." 437 U.S. at 593. Thus, *Flook* held that "[t]he *obligation* to determine" whether a discovery is patentable under § 101 "*must precede* the determination of whether that discovery is, in fact, new or obvious." *Id.* (emphasis added). Other decisions are to the same effect. *See, e.g.*, *Diamond v. Diehr*, 450 U.S. 175, 188-89 (1981) (considering whether claims were "barred at the threshold by § 101"); *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 483 (1974) ("no patent is available for a discovery, however useful, novel, and nonobvious, unless it falls within one of the express categories of patentable subject matter.").

That is not to say that Section 101 is jurisdictional, or that district courts lack discretion to consider other issues first in some instances. Usually, however, it is in the court's and the parties' interest to address patentability under Section 101 first—as a "threshold test," at the outset of the invalidity case, before considering other invalidity issues such as anticipation under Section 102 or obviousness under Section 103. Anticipation and obviousness requires analysis of prior art and the meaning of that art to the relevant scientific community. Those analyses typically involve expensive competing technical experts who must each review documents, prepare reports, be deposed, and respond to the contentions of the other side's expert. Sections 102 and 103 also typically require formal claim construction, which is another time-consuming and expensive process.

Unlike those other issues, however, the Section 101 inquiry generally does not require formal claim construction or discovery (expert or otherwise). *See, e.g.*, *Bilski*, 130 S. Ct. at 3231 (finding patent application ineligible without formal claim construction); *Cyberfone Sys., LLC v. CNN Interactive Grp.*, No. 2012-1673, 2014 U.S. App. LEXIS 3599, at *7 & n.1 (Fed. Cir. Feb. 26, 2014) (same); *Bancorp*, 687 F.3d at 1273 (claim construction "not an inviolable prerequisite to a validity determination under § 101"); *see also generally Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013) (eligibility of claims for naturally occurring and synthetic DNA determined on the basis of the pleadings, without discovery); *see also CyberSource Corp. v. Retail Decisions, Inc.*, 620 F. Supp. 2d 1068 (N.D. Cal. 2009) (accepting claim constructions proposed by the non-moving party for summary judgment purposes, and granting summary judgment of invalidity under § 101), *aff'd* 654 F.3d 1366 (Fed. Cir. 2011); *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 768 F. Supp. 2d 221 (D.D.C. 2011) (same).

This Court has long acknowledged that "patent litigation is a very costly process," *Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found.*, 402 U.S. 313, 334 (1971). Today, the median cost of defending a patent suit with $1 to $25 million at stake is more than $2 million, and more than half of that cost is incurred during discovery. Am. Intell. Prop. Law Ass'n, *Report of the Economic Survey 2013* at 34 (July 2013). Where an ineligible patent can be identified and a case resolved before claim construction or discovery, there is no need to delay, and good reason not to. The court efficiently marshals its own resources and spares the parties much of the expense of unnecessary patent litigation and the attendant uncertainty and settlement pressure.

Second, the Court's precedents confirm that Section 101 establishes a substantive test for patentability, and reject the contrary notion that Section 101 must be read narrowly or applied leniently to avoid any overlap with other sections of the Patent Act. *See Flook*, 437 U.S. at 592 (rejecting Flook's argument that the Court "improperly import[ed] into § 101 the considerations of 'inventiveness' which are the proper concerns of §§ 102 and 103."); *Mayo*, 132 S. Ct. at 1303-04 ("[T]he § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap .... to shift the patent-eligibility entirely to these later sections risks ... assuming that those sections can do work that they are not equipped to do.").

Bilski—this Court's first Section 101 case since the creation of the Federal Circuit—did not change either of those principles; it reaffirmed both. *Bilski* reaffirmed that "[t]he § 101 patent-eligibility inquiry is only a threshold test," as a "claimed invention must *also* satisfy 'the conditions and requirements of this title,' such as "that the invention be novel, see

§ 102, nonobvious, see § 103, and fully and particularly described, see § 112." 130 S. Ct. at 3225 (emphasis added). Applying the "threshold test" of Section 101, the Court resolved *Bilski* "narrowly on the basis of ... *Benson*, *Flook*, and *Diehr*," *id.* at 3229, and held that a patent application claiming a procedure for hedging against the risk of price changes was unpatentable under 35 U.S.C. § 101 because it was an "abstract idea, just like the algorithms at issue in *Benson* and *Flook*." *Id.* at 3231. The unpatentability of "laws of nature, physical phenomena, and abstract ideas," *Bilski* noted, "defined the reach of the statute as a matter of statutory *stare decisis* going back 150 years." *Id.* at 3225.

Further underscoring that Section 101 is a rigorous, substantive test, Justice Breyer, joined by Justice Scalia, criticized the comparatively lenient test that the Federal Circuit had previously applied in *State Street Bank*, where "anything which produces a 'useful, concrete, and tangible result' ... is patentable." *Id.* at 3259 (Breyer, J., concurring).

Less than six months after *Bilski*, however, a panel of the Federal Circuit took that decision as an invitation to discard both of the above principles. In *Research Corporation*, the Federal Circuit read *Bilski*'s description of Section 101 as a "threshold test" not as a directive to reach questions of patent eligibility early in litigation, but as a suggestion that Section 101 is not a rigorous, substantive test of patentability. 627 F.3d at 867-69. Instead, the Federal Circuit panel asserted, Section 101 "directs *primary attention*" to other "conditions and requirements of Title 35." 627 F.3d at 868 (emphasis added). Thus, the court reasoned, Section 101 is merely a "coarse eligibility filter," *id.* at 869, and if a patent is to be invalidated under Section 101 as claiming an "abstract idea," the abstractness "should exhibit itself *so manifestly* as to override the broad statutory categories of eligible subject matter and the statutory context that directs *primary attention on the patentability criteria of the rest of the Patent Act.*" *Id.* at 868. In other words, the *Research Corporation* panel announced that Section 101's test for patentability should be deemed satisfied unless it is "manifestly evident" that it is not satisfied, and that the preferable course is to avoid the question altogether.

Research Corporation spawned an aberrant line of Federal Circuit decisions that held—in increasingly strident terms—that Section 101 is a non-substantive, "broadly permissive" "coarse filter" that weeds out only "manifestly" unpatentable claims, and that takes a back seat to other provisions of the Patent Act. *See Classen*, 659 F.3d at 1066 ("[T]he preferable procedure, when the claims are within the general classes of § 101 subject matter and not manifestly abstract, is to apply the [other] *substantive* conditions and requirements of patentability.") (emphasis added); *Ultramercial*, 657 F.3d at 1326 (Section 101 is "broadly permissive," and "makes clear that the categories of patent-eligible subject matter are no more than a 'coarse eligibility filter' ... [and] not substitutes for the *substantive* patentability requirements set forth in § 102, § 103, and § 112.") (emphasis added); *MySpace*, 672 F.3d at 1261 ("courts should avoid reaching for interpretations of broad provisions, such as § 101, when more specific statutes, such as §§ 102, 103, and 112, can decide the case."). *Classen* and *MySpace* predictably drew dissenting opinions criticizing the majority's "coarse filter" approach, and *Ultramercial* was vacated by this Court and remanded for reconsideration in light of *Mayo*. *Classen*, 659 F.3d at 1075-81 (Moore, J., dissenting); *MySpace*, 672 F.3d at 1268-70 (Mayer, J., dissenting) (explaining practical and legal defects in the "coarse eligibility filter" approach); *WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012) (vacating and remanding *Ultramercial*).

To the extent that *Research Corporation* did not rest on a clear misreading of *Bilski*, *Mayo* should have put the "coarse filter" line of cases definitively to rest two Terms ago. In *Mayo*, the Solicitor General explicitly invoked the "coarse filter" concept to argue that the claim in *Mayo* was patent-eligible. Section 101 should be applied as a "coarse filter," the Solicitor General argued, because other sections of the Patent Act "permit the nuanced, fact-intensive distinctions necessary to separate patentable from unpatentable inventions." Br. of the United States as Amicus Curiae in Support of Neither Party, at 11, *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012) (No. 10-1150), *available at* 2011 WL 4040414. This Court *unanimously* and forcefully rejected that invitation to screen low-quality patents through other statutes, rather than rigorously enforcing Section 101. *Mayo*, 132 S. Ct. at 1303-04. In particular, the Court rejected the idea that Section 101 should be read narrowly, remarking that, although the Section 101 inquiry "might sometimes overlap" with other provisions, that is not a reason to avoid the Section 101 analysis in favor of the other validity provisions of the Patent Act. *Id.* at 1304. "[T]o shift the patent-eligibility inquiry entirely to these later sections risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do." *Id.* Further, the Court noted that avoiding Section 101 in deference to other provisions of the Patent Act was "not consistent with prior law," because the relevant precedents of this Court "rest their holdings upon section 101, not later sections." *Id.* at 1303. The Solicitor General's approach, the Court explained, would make the applicable "exception to § 101 patentability a dead letter." *Id.* Instead, the Court applied § 101 rigorously, and unanimously ruled that the claim was unpatentable, as it "present[ed] a case for patentability that is weaker than the (patent-eligible) claim in *Diehr* and no stronger than the (unpatentable) claim in *Flook.*" *Id.* at 1299.

Nonetheless, even after *Mayo*, Federal Circuit cases—including both the panel opinion in this case and the *Ultramercial* case this Court remanded for consideration of *Mayo*—continued to apply the discredited *Research Corporation* "coarse filter" conception of Section 101, to screen for only "manifestly" ineligible patents. *See CLS Bank*, 685 F.3d at 1352 ("this court holds that when—after taking all of the claim recitations into consideration—it is not manifestly evident that a claim is directed to a patent ineligible abstract idea, that claim must not be deemed for that reason to be inadequate under § 101") (panel opinion);

Ultramercial, 722 F.3d at 1341, 1354 (reversing district court where majority concluded "the claimed invention is not 'so manifestly abstract as to override the statutory language of section 101.' *Research Corp.*, 627 F.3d at 869."); *cf. CLS Bank*, 717 F.3d at 1326 (Newman, J., concurring, on rehearing en banc) (citing *Research Corporation* for "coarse filter" reasoning).

To the credit of other judges, these post-*Mayo* decisions were not unanimous. *CLS Bank* and *Ultramercial* drew separate opinions criticizing the majority's disregard for *Mayo*. *CLS Bank*, 685 F.3d at 1357 (Prost, J., dissenting) ("[T[he majority's 'manifestly evident' standard ... has resurrected the very approach to § 101 that the Solicitor General advocated—and the Supreme Court laid to rest—in [*Mayo*]."); *Ultramercial*, 722 F.3d at 1354 (Lourie, J., concurring) ("I write separately because I believe that we should concisely and faithfully follow the Supreme Court's most recent guidance regarding patent eligibility in *Mayo*.").

Nonetheless, despite this Court's unequivocal ruling in *Mayo*, and despite decades of consistent precedent consistently applying Section 101 as a rigorous substantive test of patentability, some Federal Circuit panels continue to treat Section 101 as if they are writing on a blank slate and free to decide cases on the basis of their own views. *CLS Bank*, 685 F.3d at 1357 (Prost, J., dissenting) ("The majority resists the Supreme Court's unanimous directive to apply the patentable subject matter test with more vigor."). Whatever difficult questions this case may present, it should be a straightforward matter to reaffirm the unanimous decision in *Mayo* that 35 U.S.C. § 101 is an ***substantive threshold*** test of patentability that should be rigorously enforced and assessed early in litigation, and to reject the line of Federal Circuit cases that continue to hold otherwise. That step alone would provide a measure of clarity and reduce the unpredictability and panel-dependency of the Federal Circuit's Section 101 decisions. *See CLS Bank*, 717 F.3d at 1321 (Newman, J., concurring) (noting panel-dependency).

II. The Addition of a Computer to An Otherwise Patent-Ineligible Process Does Not Render That Process Patentable Unless the Computer is Essential to the Process.

"Mental processes" and "abstract intellectual concepts" have never been patent eligible because they are "basic tools of scientific and technological work." *Benson*, 409 U.S. at 67. "[M]onopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it." *Mayo*, 132 S. Ct. at 1293. Because all inventions necessarily apply basic scientific tools and concepts at some level, however, the Court has distinguished between eligible and ineligible patents on the basis of whether the patent embodies an "inventive concept" *apart from and in addition to* the underlying abstraction, or whether the patent is essentially a monopoly on the underlying abstraction itself. *Mayo*, 132 S. Ct. at 1294; *Flook*, 437 U.S. at 594. The patent "must do more than simply state the law of nature while adding the words 'apply it.'" *Mayo*, 132 S. Ct. at 1294 (citing *Benson*). While Alice argues that *anything* more than "apply it" will suffice, Br. for Petitioner § I.C, this Court has consistently held otherwise.

Mayo explained the "inventive concept" necessary to distinguish a patentable invention from an unpatentable one in the following terms:

> [T]he Court's precedents ... warn us against interpreting patent statutes in ways that make patent eligibility "depend simply on the draftsman's art" without reference to the "principles underlying the prohibition against patents for [natural laws]." They warn us against upholding patents that claim processes that too broadly preempt the use of a natural law. And they insist that a process that focuses upon the use of a natural law *also* contain other elements or a combination of elements, sometimes referred to as an *"inventive concept,"* sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself.

132 S. Ct. at 1294 (emphasis added, citations omitted); *see also Flook*, 437 U.S. at 594.

The "inventive concept" requirement is substantive, and cannot be met by clever drafting where the patentee simply adds generic machine or field-of-use limitations, "insignificant post-solution activity," or "purely conventional or obvious pre-solution activity" as window dressing to an otherwise unpatentable mathematical algorithm. *Mayo*, 132 S. Ct. at 1297-98; *see also id.* at 1297 (patent must "provide practical assurance that the process is more than a drafting effort designed to monopolize the law of nature itself"); *see also Bilski*, 130 S. Ct. at 3231; *Diehr*, 450 U.S. at 191-92; *Flook*, 437 U.S. at 589-91; *Benson*, 409 U.S. at 71-72.

While the distinction between an "inventive concept" and insignificant additions may be elusive in some cases, two useful, complementary, insights emerge from the Federal Circuit's specific experience applying this Court's Section 101 cases, such as *Benson*, *Flook*, *Diehr*, and *Bilski*, to computer-implemented inventions: *first*, the use of a computer merely to make a patent-ineligible process faster or more efficient does not make the process patent-eligible under Section 101; and *second*, a computer must be *essential* to an otherwise patent-ineligible process to make that process patent-eligible. Recognizing and applying those insights here would bring a measure of needed clarity to the doctrine of patent-eligibility, and would definitively resolve this case.

A. Integration of a computer fails to provide an "inventive concept" if a human could perform the same process without a computer.

Although the use of a computer makes tasks faster or easier, the Federal Circuit has recognized with some consistency that the use of a computer to make an otherwise patent-ineligible process easier or more efficient does not transform that process into a patent-eligible invention. *See Bancorp*, 687 F.3d at

1277-81; *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1332-33 (Fed. Cir. 2012); *Fort Properties, Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1323 (Fed. Cir. 2012); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1376-77 (Fed. Cir. 2011); *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1333 (Fed. Cir. 2010); *cf. Cyberfone*, 2014 U.S. App. LEXIS 3599, at *6, *8-12 (discussing *Bancorp*, *Dealertrack*, *Fort Properties*, *CyberSource*, and *SiRF*).

In *Bancorp,* for example, the Federal Circuit considered a patent covering a computerized means for "administering and tracking the values of life insurance policies in separate accounts." 687 F.3d at 1269. Although the process would be "inefficient" without a computer, *id.* at 1275, the Court recognized that the claimed process of tracking, reconciling, and administering a life insurance policy with a stable value component could be done manually. *Id.* at 1277-78. As the court noted, the computer was not "integral to the claimed invention," but rather "employed only for its most basic function, the performance of repetitive calculations." *Id.* at 1278.

Similarly, in *Fort Properties,* the Federal Circuit rejected a patent claim covering a computer-aided method for enabling tax-free property exchanges. Noting that the computer did not play a significant part in permitting the claimed process to be performed, *id.* 671 F.3d at 1322-23, the Court concluded that the claimed investment tool did not require the use of a computer, *id.* at 1322. Thus, the claimed process was unpatentable under Section 101 because the process was not materially different than it would be if performed by a human being without a computer.

Likewise, in *Dealertrack*, 674 F.3d at 1332-33, the Federal Circuit rejected a patent claim covering a computer-aided method of applying for credit. Despite a "computer aided" limitation, the Court concluded that the claims were directed to an abstract idea because the claims were silent as to how or to what extent the computer aided the process. *Id.* at 1333 ("Simply adding a 'computer aided' limitation to a claim covering an abstract concept, without more, is insufficient to render a claim patent eligible."). *Dealertrack* was consistent with the Federal Circuit's earlier decision in *CyberSource*, which concluded that a claimed method of verifying internet credit card transactions was not patent-eligible under Section 101. 654 F.3d at 1376–77. *CyberSource* reasoned that because all of the steps in the claimed process could be performed by a person using pen and paper, *id.* at 1372, the claims impermissibly attempted to capture a patent-ineligible mental process, *id.* at 1376–77.

On the other side of the line, and applying the same principle, the Federal Circuit ruled in *SiRF Technology* that the patents at issue *did* recite patentable subject matter. 601 F.3d at 1331-33. Consistent with the above authorities, *SiRF* recognized that "for the addition of a machine to impose a meaningful limit on the scope of a claim, it must play a significant part in permitting the claimed method to be performed, rather than function solely as an obvious mechanism for permitting a solution to be achieved more quickly."

Id. at 1333. The *SiRF* panel found that the specific hardware recited—a "*particular* GPS receiver that receives the satellite signals"—imposed meaningful limits where that *specific* hardware was necessary to generate the claimed "pseudoranges" and where there was "no evidence ... that the calculations here can be performed entirely in the human mind." *Id.* at 1332-33.

Bancorp, Fort Properties, CyberSource, and SiRF demonstrate a key principle that follows from this Court's cases distinguishing "inventive concepts" from "post-solution activity": a patent-ineligible abstract idea or mental process cannot be transformed into a patent-eligible process merely by implementing the idea or executing the process with the assistance of a computer. Even though the process may become easier, cheaper, or more efficient through the integration of a computer, these improvements are insufficient to transform patent-ineligible subject matter into a patent-eligible process under Section 101. Such use of a computer is akin to the addition of "well-understood, routine, conventional activity already engaged in by the [relevant] community" that this Court recognized in *Mayo* as "add[ing] nothing significant beyond the sum of their parts individually." 132 S. Ct. at 1298.

B. Integration of a computer can provide an "inventive concept" if the use of the computer is essential to the execution of the process.

The concern that this Court has consistently expressed in its Section 101 cases—patents preempting basic, fundamental concepts of human activity—is especially acute with software patents. That is because software is purely functional.

At a basic level, computer processors operate by executing binary numerical "machine language" instructions compiled from instructions written in a higher-level programming language such as BASIC, Pascal, COBOL, or C++. *See* W. Ford & W. Topp, THE MC68000: ASSEMBLY LANGUAGE AND SYSTEMS PROGRAMMING 2-5 (1987). The higher-level programming language is merely a convenient overlay that permits users to write programs with English-like statements and mathematical symbols. *Id.* at 2. The high-level programming language is independent of any specific computer, and can be translated into machine code by an appropriate compiler. *Id.* at 3-4. Thus, as an article cited in the Petitioner's Brief puts it, "the genius of computers is that structure and function can be almost completely separated." Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905, 919. Because software is functional, patentees such as Alice can claim "not what they built, but ... anything that achieves the same goal, no matter how different it is," *id.* at 908, which is analogous to a pharmaceutical patent claiming "'an arrangement of atoms that cures cancer,'" asserted against anyone who purports to accomplish that goal by whatever means. *Id.*[3]

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[3] Alice's suggestion that this fundamental problem with software patents "will soon [be] address[ed] in *Nautilus, Inc. v. Biosig Instruments, Inc.*, No. 13-369," is dubious. Br. for Petitioner at 43. *Nautilus* does not involve a software patent, and the indefiniteness issue in that case arises under 35 U.S.C.

In the context of computer-aided claims, the Federal Circuit's precedent has produced a useful insight directed at that concern: "[t]o salvage an otherwise patent-ineligible process, a computer must be *integral* to the claimed invention, facilitating the process *in a way* that a person making calculations or computations could not." *Bancorp*, 687 F.3d at 1278 (emphasis added).

In *SiRF*, as noted above, the computer-implemented invention was patent-eligible where the *particular* hardware recited was not a general-purpose computer, but a "*particular* GPS receiver" that received specific physical inputs and "satellite signals," that was absolutely necessary to generate the claimed "pseudoranges," and where there was "no evidence ... that the calculations here can be performed entirely in the human mind." 601 F.3d at 1332-33.

In *Research Corporation*, although the panel erroneously performed the Section 101 analysis as a "coarse eligibility filter" and without the rigor that precedent requires, *supra* § I, the panel nonetheless recognized the essential principle that the "computer" limitations must be *necessary* to the execution of the process. The *Research Corporation* panel noted two factors that provided the necessary inventive concept. First, the claimed invention satisfied a market need for a process that produced higher quality halftone images while simultaneously using less computer processor power and memory. 627 F.3d at 865. And second, because the claimed method required the simultaneous complex manipulation of millions of individual pixels in multiple images, "the method could not, as a practical matter, be performed entirely in a human's mind."

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§ 112(b). The cited portion of the Lemley article explicitly concerns § 112(f).

Bancorp, *SiRF* and *Research Corporation* are specific applications of the boundary between patent-eligible and patent-ineligible claims that this Court drew in *Diehr* and *Flook*. *See Mayo*, 132 S. Ct. at 1298-99 (discussing *Diehr* and *Flook*). In *Diehr*, the underlying Arrhenius equation was not patentable, but the overall process was patentable "because of the way additional steps of the process integrated the equation into the process as a whole": there was no suggestion in *Diehr* that the additional steps "were in context obvious, already in use, or purely conventional." *Mayo*, 132 S. Ct. at 1298-99 (discussing *Diehr*). In *Flook*, on the other hand, the additional steps were all "conventional or obvious" and added nothing to the underlying mathematical formula. *Id.* at 1299. Consistent with *Diehr*, *Flook*, and *Mayo*—*Bancorp*, *SiRF*, and *Research Corporation* demonstrate that the specific application of a computer-aided mental process may be patent eligible when the process could not be performed by a human being without the assistance of a computer.

III. Alice's Claims are Unpatentable Under Section 101.

The integration of a computer is not essential to Alice's claimed processes beyond making those processes faster or more efficient. Alice's claims are thus akin to the patent-ineligible processes in *Flook*, *Bilski*, *Bancorp*, *Fort Properties*, *Dealertrack*, and *CyberSource*, and unlike the patent-eligible processes in *Diehr*, *SiRF*, and *Research Corporation*.

Following a careful analysis of this Court's precedents and Alice's patents, the district court recognized that Alice's patents are directed to the "abstract idea of employing an intermediary to facilitate simultaneous exchange of obligations in order to minimize risk." *CLS Bank*, 768 F. Supp. 2d at 243. In other words, Alice has patented computer-implemented escrow, "a basic business or financial concept much like [that] struck down in *Bilski*." *Id.*

The unpatentability of Alice's claims is perhaps clearest in method claim 33 of Patent No. 5,970,479—which Alice describes as "representative," and which does not recite a computer at all. *See Add. 1a, infra*. As CLS well explains, that claim is simply a broad claim to financial intermediation, indistinguishable from the patent-ineligible claim 1 in *Bilski*. Br. for Respondent at 25-28. Alice states that "the method claims require the use of a computer," and refers to statements in the patent's specification regarding an "automated infrastructure" that works in "real-time." Br. for Petitioner at 9. Taking Alice at its word, this is a classic case of a process a human could perform, where the "computer" adds nothing but speed and efficiency (in "real-time"), much like the unpatentable claims in *Bancorp*, *Fort Properties*, and *Dealertrack*. *See* § II.A, *supra*. The "computer" is not "integral to the claimed invention," but rather "employed only for its most basic function"—speed and automation. *Bancorp*, 678 F.3d at 1278. In other words, the use of a computer to carry out financial mediation in "real-time" is the sort of "well-understood, routine, conventional activity already engaged in by the [relevant] community" that "add[s] nothing significant" to the claims to render them patentable. *Mayo*, 132 S. Ct. at 1298.

Alice's system claims fare no better. They broadly recite generic computers "configured to" perform part or all of the claimed "methods." This Court's observation in *Quanta Computer, Inc. v. LG Electronics*, 553 U.S. 617, 629 (2008)—that "[a]pparatus and method claims may approach each other so nearly that it will be difficult to distinguish the process from the function of the apparatus"—is particularly apt here. *See also Benson*, 409 U.S. at 67-68 ("the same principle applies" to the patentability of method and system claims). Comparing the method and system claims Alice describes as "representative"—method claim 33 of Patent No. 5,970,479 (*Add. 1a, infra*), and system claim 26 of Patent No. 7,725,375 (*Add. 2a, infra*)—shows that Alice has taken its claims for "methods" of financial intermediation and claimed an arrangement of generic, functional computer parts (a "data processing system," "data storage unit," and "communications controller") "configured to" assist with or carry out the methods. *Add. 2a*, *infra.* The method step of "creating" shadow records, for example, appears in the system claim's recitation of a "data storage unit" having that information "stored therein." Similarly, the "obtaining," "adjusting" and "instructing" method steps appear in the system claim's recitation of a "computer," "configured to" "receive a transaction," "adjust" shadow records, and "generate an instruction" to an exchange institution "adjust" records. Alice's brief makes no effort to deny that it relies on the simple recitation of generic computer parts to save its claims. Alice asserts that it invented a "machine," by simple virtue of the fact that its "system" claims recite generic computer parts such as a "data processing system," a "data storage unit," and a "communications controller." Br. for Petitioner at 6-9.

Alice, of course, did not invent any of the claimed hardware, and its claims are not limited to any particular source-code implementation of the claimed methods. *See* Br. for Petitioner at 9. Alice is presumably suing CLS because it believes that CLS is performing financial mediation using a computer, as opposed to depending on pen and paper to do so. Alice's "computer" is not integral to the claims, unlike the application-specific "*particular* GPS receiver" of *SIRF* that was necessary to generate claimed "pseudoranges" and perform calculations that humans could not. *See supra* § II.B. Rather, it is precisely the sort of artificial draftsmanship that this Court has rejected in cases such as *Mayo*, 132 S. Ct. at 1297 *Bilski*, 130 S. Ct. at 3231; *Flook*, 437 U.S. at 589-91; and *Benson*, 409 U.S. at 71-72, as "insignificant post-solution activity," and precisely the sort of gimmick to which patentees often resort to avoid having their cases dismissed at the threshold of litigation.

The district court correctly recognized that Alice's token recitation of generic computer parts such as a "data processing system," a "data storage unit," and a "communications controller" did not supply the required "inventive concept." *CLS Bank*, 768 F. Supp. 2d at 247 ("The method claims before the court are not limited by electronic implementation, and ... would serve to patent the fundamental and abstract concept itself."). *Mayo* explained that Section 101 requires that a patent "provide practical assurance that the process is more than a drafting effort designed to monopolize the law of nature itself." 132 S. Ct. at 1297. As the district court correctly concluded, Alice's patent provides no such assurance. *CLS Bank*, 768 F. Supp. 2d at 253 ("The system claims are not a specific and limited application of a general business concept, but instead seek to preempt the concept itself when employed by any computer coupled with a data storage unit."). Indeed, the dependent claims underscore just how staggeringly broad Alice's claims are. *Id.* at 246 ("by looking to the dependent claims ... one understands the reach of the methods claimed ... If patentable, these claims could preempt the use of an electronic intermediary, using shadow credit and/or debit records, as a manner in which to exchange an infinite array of tangible and intangible representations of value.").

It is critical to the functioning of the Nation's banking system that the Court recognize and apply the insights described above to the claims in this case and affirm the ruling of the district court and the en banc Federal Circuit that the claims are unpatentable under 35 U.S.C. § 101. The Clearing House clears more than $2 trillion per day across its networks, and as its members rely increasingly on computers, they are increasingly attractive targets for patentees seeking royalties on patents claiming longstanding financial practices as patent-eligible business methods, based solely on the integration of a computer. As CLS aptly puts it, such patentees have recited an economic concept like "escrow" and added some variation of the words "compute it." Br. for Respondent at 1. If *Bilski* and *Mayo* are to be applied faithfully here, the unpatentability of Alice's claims must be affirmed.

Claims such as in *Bancorp*, *Dealertrack*, and *in this case* are problematic for the financial industry when courts decline to enforce Section 101 rigorously. Because of the functional nature of software, patentees like Alice can claim "not what they built, but ... anything that achieves the same goal, no matter how different it is," Lemley, 2013 Wisc. L. Rev. at 908. Most financial transactions are, at base, mathematical algorithms of the type that this Court has historically found categorically unpatentable. Nevertheless, patentees such as Alice often have little difficulty describing a basic class of financial transaction, and obtaining a patent that broadly covers any electronic implementation of that transaction.

As two Justices observed in *Bilski*, quoting Judge Mayer's dissent below, after the Federal Circuit announced a very lenient test for Section 101 in *State Street Bank*, what followed was "patents that 'ranged from the somewhat ridiculous to the truly absurd.'" *Id.* at 3259 (Breyer, J., concurring) (quoting *In re Bilski*, 545 F.3d 943, 1004 (Fed. Cir. 2008) (en banc) (Mayer, J., dissenting)). The quoted Judge Mayer dissent noted some examples:

> *See, e.g.*, ... U.S. Patent No. 5,862,223 (method for selling expert advice); U.S. Patent No. 6,014,643 (method for trading securities); U.S. Patent No. 6,119,099 (method of enticing customers to order additional food at a fast food restaurant); U.S. Patent No. 6,329,919 (system for toilet reservations); .... There has even been a patent issued on a method for obtaining a patent. *See* U.S. Patent No. 6,049,811.

Bilski, 545 F.3d at 1004 (Mayer, J., dissenting). While some of those examples are merely amusing, similar patents have had real and pernicious consequences for the financial industry.

As one example, a holding company named "Every Penny Counts" has several patents claiming protection for the basic math of rounding off, and has sued Bank of America, Visa, American Express, and numerous other financial institutions whose services include any rounding-off component performed by a computer. *See, e.g.*, *Every Penny Counts, Inc. v. Am. Express Co.*, 563 F.3d 1378, 1380-81 (Fed. Cir. 2009). Like Alice, Every Penny Counts' patents include system claims that attempt to avoid Section 101 by cloaking the unpatentable algorithm in generic machine parts. *See CLS Bank*, 768 F. Supp. 2d at 239-41 (discussing *Every Penny Counts*). In litigation against Bank of America, Every Penny Counts filed a complaint requesting a permanent injunction, treble damages, and attorney fees based on what it referred to as its "Rounder Patent." Every Penny Counts argued that its system claims were patentable because they recited "a system comprised of structural components, including a network, a point of sale terminal, a card reader, and a bank's central computer that is programmed to carry out an algorithm." Every Penny Counts, Inc., Mot. for Summ. J., 2009 WL 1240559 (Mar. 16, 2009). The district court rejected that contention, and properly so. *See Every Penny Counts, Inc. v. Bank of Am. Corp.*, No. 2:07-CV-042, 2009 WL 6853402, at *1 (M.D. Fla. May 27, 2009). Every Penny Counts has never prevailed in court, but has been able to exploit the prevailing uncertainty over the scope of Section 101 to extract settlements and force the financial industry to pay significant legal fees to defend against strike suits.

As another example, a holding company named "Content Extraction and Transmission" (CET) has likewise sued much of the banking industry, on a handful of patents covering the basic notion of "processing information." *See, e.g., Content Extraction & Transmission v. Wells Fargo Bank*, No. 12-2501, 2013 WL 3964909 (D.N.J. July 31, 2013). Specifically, CET's asserted claims cover the mere abstract idea of extracting, storing, and/or processing data from hardcopy documents. *Id.* at *2. On these claims, CET asserted infringement against the banks for the processing of deposits at ATMs and by mobile phones. In defending the validity of its patents, CET argued that the generic recitation of a "scanner" and a "computer" in certain of its claims was sufficient to satisfy the Section 101 patentability requirement. The district court rejected that argument, however, stating: "gathering information from a hardcopy document can be done by hand and manually inputted into a general purpose computer. The fact that a scanner, or other machine, may make a given step more efficient does not render the machine integral." *Id.* at *12. To that end, the district court recognized, "the mere use of a computer to more quickly and efficiently—or as in the case of the alleged infringement in this case, process deposits at an ATM—accomplish a given task does not create meaningful limitation on an otherwise abstract and wide-ranging concept." *Id.* The court in *CET* got it right, holding these claims unpatentable as a threshold matter. Nevertheless, *CET* illustrates the pernicious consequences resulting from the uncertainty in Section 101 jurisprudence, which is leaving the Nation's banking industry to repeatedly defend itself against patents claiming basic, fundamental processes.

If Alice's recitation of generic computer parts is sufficient to make its algorithm patent eligible, then Section 101 is a dead letter in the realm of software, and the result will be a tax on the financial industry, paid to any patentee clever enough to cloak a basic transaction in generic computer parts. The Court should decline Alice's invitation to roll back the essential protections that Section 101 has provided for more than a century against the sorts of patents that "tend to impede innovation more than ... promote it." *Mayo*, 132 S. Ct. at 1293.

CONCLUSION

The Court should reaffirm that Section 101 is a substantive, threshold test of patentability that should be assessed early in the litigation. And the Court should hold that the addition of a computer to an otherwise patent-ineligible mental process does not transform that process into a patent-eligible invention unless the integration of the recited computer is essential to performing the claimed process, and not merely used to make the process easier, cheaper, or more efficient to perform. Applying those principles to this case, the Court should affirm the judgment that all of Alice's asserted claims are unpatentable under 35 U.S.C. § 101.

Respectfully submitted,

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ADDENDUM

U.S. Patent No. 5,970,479, claim 33 (JA383-84):

A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:

> (a) creating a shadow credit record and a shadow debit record for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
>
> (b) obtaining from each exchange institution a start-of-day balance for each shadow credit record and shadow debit record;
>
> (c) for every transaction resulting in an exchange obligation, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order, and
>
> (d) at the end-of-day, the supervisory institution instructing ones of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, the credits and debits being irrevocable, time invariant obligations placed on the exchange institutions.

U.S. Patent No. 7,725,375, claim 26 (JA1260-61):

A data processing system to enable the exchange of an obligation between parties, the system comprising: a communications controller, a first party device, coupled to said communications controller, a data storage unit having stored therein (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and a computer, coupled to said data storage unit and said communications controller, that is configured to (a) receive a transaction from said first party device via said communications controller; (b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and (c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

AMICUS
CURIAE
BRIEF

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AND
BRIEFS

No. 13-298

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IN THE

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Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,

Respondents.

On Writ of Certiorari to the
United States Court of
Appeals for the Federal
Circuit

BRIEF OF *AMICUS CURIAE* COMPUTER & COMMUNICATIONS INDUSTRY ASSOCIATION IN SUPPORT OF RESPONDENTS

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INTEREST OF *AMICUS CURIAE*[1]

The Computer & Communications Industry Association (CCIA) represents large, medium-sized, and small companies in the high technology products and services sectors, including computer hardware and software, electronic commerce, telecommunications and Internet products and services — companies that collectively generate approximately a quarter trillion in annual revenues. [2] CCIA members are substantially affected by the patent system and depend upon it to fulfill its constitutional purpose.

SUMMARY OF THE ARGUMENT

Software is unlike most types of technology in that the nature of software can easily result in the kind of overbroad patents that this Court has warned against since at least *O'Reilly v. Morse*, 56 U.S. 62 (1853). This is because software is inherently mathematical — that is, any piece of software code is computing a mathematical function — and because the lower courts have tended to allow software-related patents to become less and less tied to particular computer hardware.

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[1] Pursuant to this Court's Rule 37.6, *amicus* affirms that no counsel for a party authored this brief in whole or in part, and no person other than the *amicus*, or its counsel, made a monetary contribution intended to fund the preparation or submission of this brief. The parties' letters consenting to the filing of this brief have been filed with the Clerk's office.

[2] A complete list of CCIA's members is available online at http://www.ccianet.org/members. CCIA is a trade association with a wide and diverse membership. It was unable to resolve the reservations of one of its members, Microsoft Corporation, prior to the filing of this brief. These views should therefore not be associated with Microsoft.

This Court recognized in *Microsoft Corp. v. AT&T Corp.*, 127 S. Ct. 1746, 1755 (2007), that computer software that is not loaded onto particular computer hardware capable of executing that software is no more than an "idea." While that case was not about patentable subject matter, the Court's basic understanding of software was correct — computer software that is not tied to particular computer hardware is nothing more than an abstraction.

Moreover, a patent that includes software that is not limited to particular computer hardware is functional claiming, which this Court struck down in *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1 (1946). Because the U.S. Court of Appeals for the Federal Circuit has created a simple, formalistic way to evade *Halliburton*, the problem of functional claiming that this Court sought to avoid has resurfaced.

This case offers the Court a chance to reaffirm *Halliburton* while giving clear guidance as to when software is patentable subject matter. *Amicus curiae* CCIA suggests that the key is the Court's *Microsoft* decision, and tying software to *specific* hardware.

Accordingly, *amicus curiae* CCIA proposes a test for patent-eligibility of software that restricts software to particular (as opposed to generic) computer hardware:

> Is the software portion of the claim restricted to specific hardware, i.e., a particular type or architecture of computer hardware?
>
> > If so, the claim is patentable subject matter.
> >
> > If not, treat the software portion of the claim as prior art[3] and examine the remaining claim to determine if what is left is patentable subject matter.

This test (hereinafter, "the specific hardware test") is supported by this Court's prior decisions and is administrable. The specific hardware test also allows some discretion, in that the level of detail that must be specified for the required computer hardware is necessarily determined case-by-case. Regardless, a generic "computer" is never sufficient to make a software claim patent-eligible.

Under current Federal Circuit law, the patent-eligibility of software-related inventions has become controversial, with some commentators suggesting that allowing such patents at all has a negative impact on innovation.[4] CCIA shares those commentators' concerns.

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[3] *See Parker v. Flook*, 437 U.S. 586, 592 (1978).

[4] *See, e.g.*, Bronwyn H. Hall & Dietmar Harhoff, *Recent Research on the Economics of Patents*, NATIONAL BUREAU OF ECONOMIC RESEARCH, Working Paper 17773 (Jan. 2012), *available at*

In the interests of finding a practical solution, however, CCIA is proposing what it believes to be a reasonable, workable test that is consistent with this Court's precedent. Accordingly, CCIA respectfully requests that the Court adopt the specific hardware test in determining the patent-eligibility of software-related inventions.

ARGUMENT

I. AS THIS COURT RECOGNIZED IN *MICROSOFT V. AT&T*, SOFTWARE IS ONLY MEANINGFUL WHEN IT RUNS ON PARTICULAR COMPUTER HARDWARE

This Court has held for over a century and a half that an idea is not patentable. *Burr v. Duryee*, 68 U.S. 531 (1863). This Court also recently observed that "[a]bstract software code is an idea without physical embodiment..."[5] Even though *Microsoft* did not address patentable subject matter, the observation is a general principle. Consistent with this principle, this Court should hold that software not tied to any particular computer hardware is not patent-eligible.

Terms such as "computer," "network," and "Internet website" are generic terms. There are literally hundreds of different types of computers, many different types of networks, and millions of types of Internet websites.

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http://elsa.berkeley.edu/~bhhall/papers/HallHarhoff12_NBER_w17773.pdf.

[5] *Microsoft*, 127 S. Ct. at 1755.

The result is that a patent claim that recites software but with no more specific hardware than a "computer" or a "website" is a purely functional claim. In a functional claim, at least one claim element is defined by the function it performs rather than a physical description. In a purely functional claim, the claim preempts every possible way of practicing the described function.

This Court recognized in *Halliburton* that functional claiming is improper, precisely because it grants an inventor too broad a monopoly. In the 1952 Patent Act, Congress created a very limited form of functional claiming, namely means-plus-function claiming. Means-plus-function claims allow a patentee to use functional claim language, but the scope of the functional claim is restricted to what the inventor describes in the specification and reasonable equivalents. Thus, means-plus-function claims avoid the problem of functional claiming (i.e., overbreadth) while still providing the convenience of describing elements by function.

Unfortunately, the U.S. Court of Appeals for the Federal Circuit has made a muddle of means-plus-function jurisprudence, turning what was supposed to be a limited exception to *Halliburton* into an easily circumvented formality. Essentially, the Federal Circuit has created a de facto rule that a claim is interpreted as means-plus-function if and only if it uses the term "means." At the same time, the Federal Circuit places no limits on functional claims. Thus, an inventor is able to take advantage of the inherent overbreadth of functional claiming simply by using placeholder words other than "means."

Accordingly, this Court should reaffirm its decision in *Halliburton* and disallow functional claims, except for the narrow exception created by Congress in 35 U.S.C. § 112(f).

A. Patents That Include Software But Are Not Restricted to Specific Computer Hardware Result in Overbroad Functional Claims

Functional claiming enables patent owners to blur claim boundaries and broadly claim technology they did not actually invent, taxing future players in the field. Functional claims are patent claims not directed to a particular machine or particular series of steps for achieving a goal, but rather the goal itself.

In the software context a functional claim means that the patentee claims to own the general function of his program, not merely the particular way he achieved that goal. Thus, the patentee has effectively captured, not just the particular instance of software he built, but also any other software that solves the same problem, no matter how different it is. The patentee claims to own the function itself.

This sort of unrestrained functional claiming has the potential to paralyze an industry.

A historical example illustrates this danger. The Wright Brothers, in their pioneering patent, did not claim the specific rudder-wing combination they invented, but rather the actual function of moving the wing and the rudder simultaneously together.[6] This broad patent allowed the Wright Brothers to clear the market of competitors, including those with far superior wing designs. It was not until the government forced the Wrights to license their patents in 1917 that airplane innovation finally took flight.[7]

This danger of functional claiming is still great in the modern era, as more complex technology has evolved. In the past few decades, the patent system has evolved such that even relatively simple products incorporate a combination of different components, each of which is often subject to multiple patents.

B. The Federal Circuit Has Created an Easy Way for Patentees to Evade *Halliburton* and Enforce Functional Claims

In *Halliburton*, the plaintiff challenged a patent drafted entirely in functional terms, referring to "means for" performing a series of functions.[8]

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[6] U.S. Patent No. 821,393, claim 7 (filed Mar. 23, 1903) ("means for simultaneously moving the lateral portions [of a wing] into different angular relations" and "means whereby said rudder is caused to present to the wind that side thereof . . . having the smaller angle of incidence").

[7] *See* Walter J. Boyne, *The Wright Brothers: The Other Side of the Coin*, WINGS OVER KANSAS, Apr. 20, 2008, *available at* http://www.wingsoverkansas.com/boyne/a268.

[8] *Halliburton*, 329 U.S. at 8–9.

Striking down "broadness, ambiguity, and [the] overhanging threat of the functional claim," the Court held that the claims were indefinite because they did not specify how the patent performed the function or limit the invention to the particular means that the patentee had actually invented.[9] Exploiting "conventional functional language at the exact point of novelty," the Court said, was not commensurate with what the patentee was removing from the public domain.[10]

When Congress passed the Patent Act of 1952 it created a narrow exception to the *Halliburton* decision to permit limited functional claiming, subject to certain conditions. Specifically, 35 U.S.C. § 112(f) (originally codified as 35 U.S.C. § 112, ¶ 6) allowed functional claims only if they were limited to the technologies detailed in the specification and reasonable equivalents. This allowed patentees the ability to use the convenient language of functional claiming without being able to claim more than they invented.

In recent years, however, the Federal Circuit has narrowly interpreted means-plus-function claims and opened the door to almost unrestricted functional claims. Interpreting Section 112(f) myopically, the Federal Circuit has said that the use of the term "means" creates a presumption that a claim element is a means-plus-element, and the absence of that term creates the opposite presumption.[11] In practice, however, these "presumptions" have become the rule.[12] The result has been evasive patent drafting: patentees have circumvented the limits of Section 112(f) by simply avoiding usage of the term "means," resulting in a dramatic increase in broad functional claims similar to the lack of structure in the pre-*Halliburton* era.[13]

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[9] *Id.* at 12-13.

[10] *Id.* at 10.

Instead of requiring patentees to disclose the structure of the underlying hardware, courts have allowed this requirement to be fulfilled by generic language like "computer" or "data processing system." For example, lower courts have found structure in language such as "a computer programmed to perform X" or "a computer aided method."[14] The term "computer," however, does not define any particular architecture or device; it is a generic term encompassing literally thousands of types of machines. Thus, patentees can currently circumvent Section 112(f) by adding structure through generic hardware limitations that ultimately preempt use of the software across multiple technologies, including personal computers, phones, and tablets.

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[11] *See, e.g., York Prods., Inc. v. Central Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1574 (Fed. Cir. 1996).

[12] *See* Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 WIS. L. REV. 905, 944-45 (2013).

[13] *See id.*

[14] *See DealerTrack, Inc. v. Huber*, 674 F.3d 1315, 1331 (Fed. Cir. 2012); *Renhcol Inc. v. Don Best Sports*, 548 F. Supp. 2d 356, 362 (E.D. Tex. 2008).

The result has been rampant functional claiming. Professor Dennis Crouch, in a study of all utility patents released between 1976 and 2011, found that use of means-plus-function language in independent claims has dropped from over 60% to less than 10% in the past 25 years.[15] In its stead, functional claiming outside the scope of Section 112(f) has grown. In that same period, independent claims incorporating functional language without actually using the word "means"—for example, "for calculating" or "for computing"—have nearly doubled from around 25% to almost 50%. Furthermore, independent claims incorporating the language referencing computers "configured to" or "configured for," language commonly used in functionally claimed patents, have grown from close to 0% to almost 30%. This troubling trend reflects how patentees have reacted to the Federal Circuit's and lower courts' rulings, abandoning the means-plus-function claiming specified by Section 112(f) for effectively equivalent language without the crucial limitations.

In failing to restrict the unchecked growth of functional claiming, the Federal Circuit has neglected the root of ambiguous patents that include software. This Court can end the abuse of Section 112(f) by reaffirming the standards from *Halliburton* and the 1952 Patent Act to guide the lower courts.

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[15] Dennis Crouch, *Functional Claim Language in Issued Patents*, PATENTLY-O, Jan. 23, 2014, *available at* http://patentlyo.com/patent/2014/01/functional-language-patents.html.

II. THIS COURT SHOULD ADOPT A TEST THAT REQUIRES SOFTWARE TO BE RESTRICTED TO A PARTICULAR COMPUTER ARCHITECTURE OR AN INDEPENDENTLY PATENTABLE PROCESS OR MACHINE

Amicus curiae CCIA proposes the following test for determining whether a software claim (or other computer-implemented invention) recites patentable subject matter under 35 U.S.C. § 101:

> Is the software portion of the claim restricted to specific hardware, i.e., a particular model or models of computer hardware?
>
> > If so, the claim is patentable subject matter.
> >
> > If not, treat the software portion of the claim as prior art[16] and examine the remaining claim to determine if what is left is patentable subject matter.

This "specific hardware test" is based on this Court's prior decisions. The specific hardware test simplifies the problem of multiple levels of abstraction that typically occurs in software, while still allowing for patents that include software. The specific hardware test also prevents overbroad functional claiming.

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[16] *See Parker v. Flook*, 437 U.S. 586, 592 (1978).

A. If Software in a Patent Claim Is Restricted to a Particular Computer Architecture, It Is Not Abstract

The main confusion about the patentability of software is whether adding a "computer" or other generic device to a claim is sufficient to make the claim patent-eligible. This confusion has generally sprung from the Federal Circuit's decision in *In re Alappat*, which states that "such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."[17]

While this statement is true as a vague principle, any particular piece of software code can only be installed on particular types of computers. For example, a word processing program might run on computers that run some versions of Microsoft Windows, but not on computers that run the Linux or Mac OS operating systems, because the same software code will not run on different operating systems. And certainly, it would make no sense to consider playing a video game on the computer in a car that controls the engine; nor would it make sense to consider the software program that runs a factory assembly line being executed on a computer that controls a microwave oven.

---

[17] *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994) (en banc).

The generic term "computer" includes a wide variety of devices with an enormous range of capabilities, such as an abacus, a digital computer that uses vacuum tubes, a tablet computer, a traditional desktop computer, and an IBM mainframe computer that takes up an entire room. Computers vary enormously in power and storage, and not every computer is capable of performing any computable task.

But if a patent claiming software is tied to particular computer hardware, such as a particular type of desktop computer, a particular configuration of computer servers, or a computer system embedded in a device (like a car), it is not an abstract idea. Rather, it is a new machine.

How particular the patent claim must be in specifying computer hardware must be evaluated on a case-by-case basis. At a minimum, the particular computer hardware must have existed at the time the patent was filed and must have sufficient capability to execute the claimed software invention.

Some of the relevant characteristics of computer hardware include: processing speed, number of central processing units (CPUs), size of computer memory, non-volatile data storage, distribution of software components and/or data among computers connected by a network, operating system, programming language used, and/or required software that must be installed for the invention to work, e.g., a web browser, a particular word processing program, etc.

The Court may adopt additional considerations as well. But it is essential that these considerations support the goal of limiting patent claims to what the inventors actually invented.

B. Means-Plus-Function Form Can Limit a Claim to a Particular Computer Architecture

For software claims not expressly limited to a particular computer architecture, means-plus-function claiming offers an alternative way to restrict a software claim to particular computer hardware. Congress created means-plus-function claims to allow limited functional claiming:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. 35 U.S.C. § 112(f).[18]

As this Court has recognized in *Parker v. Flook*, 437 U.S. 586 (1978), and *Diamond v. Diehr*, 450 U.S. 175 (1981), software without hardware is merely an abstract idea, and can only be saved through the structure that hardware limitations provide. These limitations can be contained in the claims of the patent. However, software claims may invoke Section 112(f) through the use of means-plus-function language. In that situation, courts should look to the specification to find this "structure" in the hardware, and accordingly limit the claims.

---

[18] Formerly § 112, sixth paragraph, under the Patent Act of 1952. Renumbered to § 112(f) under the Leahy-Smith America Invents Act of 2011.

C. If Software in a Patent Claim Is Not Limited to Particular Computer Hardware, This Court's Precedent Says That the Software Cannot Be Considered When Assessing Patentability

If software recited in a patent claim is not limited to specific hardware, the software portion of the claims cannot be included for assessing patent-eligibility. The claim should be treated as if the software was well known.[19] Then, the court should analyze the claim as a whole to see if it recites anything more than simply executing the software on generic computer hardware.[20]

Computer hardware, separate from software, does not create meaningful limitations to software claims under Section 101. Though Petitioners claim that computers function "through the physical manipulation of switches" and thus "cannot be an abstract idea in the sense of a disembodied concept," Brief for Petitioner at 35, this claim belies both the history and the modern reality of what defines a computer. The word "computer" first arose in the context of machines in the 19th century as a device or machine for performing or facilitating calculations, composed of a complex series of switches and gears. Thus, the earliest "computers" simply performed math. In the 1800s, the computer's setup of gears and switches represented its hardware, while the mathematical functions performed represented its software. Of course, using these computers to perform abstract mathematical functions did not suddenly render these mathematical functions patentable. A specific machine's hardware, with its unique setup of gears and switches, may have been patentable. But that would not have stopped another inventor from using a different machine, with an alternate setup of gears and switches, from performing the same mathematical function.

---

[19] *Flook*, 437 U.S. at 592.

[20] *Id.* at 596; *Mayo Collaborative v. Prometheus Labs.*, 132 S. Ct. 1289, 1294 (2012).

Computers have evolved, but the distinction between hardware and software remains the same. Computer software has expanded beyond merely performing math to a variety of applications, including speech recognition, operating systems, and financial services. As a result, the question of patentability has become more blurred than it was in the 19th century.

The usefulness of Section 101 to determine the patentability of software is blunted by the Federal Circuit's reliance on unrelated hardware limitations. When patentees recite a generic "computer" in their claims, they are using insufficient hardware limitations to save software from abstraction. For example, Judge Lourie found in *Accenture v. Guidewire* that "simply implementing an abstract concept on a computer, without meaningful limitations to that concept, does not transform a patent ineligible claim into a patent-eligible one."[21] Furthermore, using a "generic computer" to make a software claim patent-eligible is contrary to this Court's ruling in *Flook*. The abstraction doctrine "cannot be circumvented by attempting to limit the use of the [abstract principle] to a particular technological environment."[22] By focusing the Section 101 inquiry on hardware instead of software, patentees are shielding the software space from the abstraction doctrine.

Petitioner[23] and at least one *amicus*[24] acknowledge that hardware and software are inseparable, and that each instruction in the software inevitably leads to a physical change in circuitry of the hardware. And this Court observed in *Microsoft* that software that is not tied to computer hardware is nothing more than an "idea."[25]

But Petitioner fails to note the discrepancy between the treatment of hardware and software within the patent system. While the USPTO and courts require hardware patentees to disclose specific circuitry—resistors, transistors, gates, power sources—to gain patent protection, there is no similar requirement for software-related patents to disclose a specific implementation of an algorithm. Thus, a patentee can claim not just the software he invented, but the entire function itself. If hardware and software are one and the same, they should be held to the same standards of specificity.

---

[21] *Accenture Global Servs. v. Guidewire Software*, 728 F.3d 1336, 1345 (Fed. Cir. 2013) (citing *Bancorp Servs. v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266, 1280 (Fed. Cir. 2012)).

[22] *Flook*, 437 U.S. at 584.

[23] Pet. Br. at 37.

[24] Br. of *amicus curiae* IEEE at 9.

[25] *Microsoft*, 127 S. Ct. at 1755.

III. THE PROPOSED TEST OFFERS A CLEAR SOLUTION THAT DEMONSTRATES THE INVALIDITY OF ALICE'S ASSERTED PATENT CLAIMS

The specific hardware test clearly demonstrates that Alice's claims are invalid under 35 U.S.C. § 101. Claim 26 of U.S. Pat. No. 7,725,375 is representative of the system claims:

> A data processing system to enable the exchange of an obligation between parties, the system comprising:
>
> a communications controller,
>
> a first party device, coupled to said communications controller,
>
> a data storage unit having stored therein
>
> > (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and
> >
> > (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

a computer, coupled to said data storage unit and said communications controller, that is configured to

(a) receive a transaction from said first party device via said communications controller;

(b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and

(c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

The specific hardware test first asks whether the claim is limited to specific hardware, either expressly or using means-plus-function format. Claim 26 recites several generic terms, namely a "computer," a "communications controller," a "first party device," and a "data storage unit." None of these are adequately specified in the claim itself. The claim contains no information about what type of computer is used, what type of communications controller is used, what type of data storage unit is used, or any information at all about what a "first party device" is.

Instead, the claim defines these nouns in terms of the functions they perform. For example, the "data storage unit" is defined by what data it stores, and the "computer" is defined by what functions it is configured to perform.

Alice does not assert that this claim is a means-plus-function claim, so the claim is not limited to particular computer hardware.

According to the specific hardware test, the software portions of claim 26, i.e., the functions recited in the claim, must be treated as known. This leaves a computer connected to a communications controller and a data storage unit. Such a system is certainly not patent-eligible.

At best, the claim is for the idea of intermediated transactions. This idea is no more patentable than the idea of hedging risk that this Court rejected in *Bilski*.[26]

Thus, Alice's asserted system claims are not patent-eligible.

---

[26] *Bilski*, 130 S. Ct. at 3231.

CONCLUSION

For the foregoing reasons, *amicus curiae* CCIA asks this Court to adopt the specific hardware test for determining the patent-eligibility of software and find that Alice's asserted claims are not patentable subject matter under 35 U.S.C. § 101.

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AMICUS
CURIAE
BRIEF

RECORD
AND
BRIEFS

Supreme Court, U.S.
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No. 13-298

In The
Supreme Court of the United States

◆

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,
Respondents.

◆

ON WRIT OF CERTIORARI TO
THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

◆

BRIEF OF AMICUS CURIAE CONEJO VALLEY BAR ASSOCIATION IN SUPPORT OF NEITHER PARTY

◆

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Brief Of *Amicus Curiae* Conejo Valley Bar Association In Support Of Neither Party[1]

INTEREST OF THE *AMICUS CURIAE*

Based in the heart of Southern California's 101 Technology Corridor, the Conejo Valley Bar Association draws its membership from local law firms and in-house attorneys serving small, mid-market and large companies. Our members' clients are predominantly high tech, high growth companies in fields such as software, biotech, e-commerce, telecommunications, semiconductors and medical devices. Our members' clients are innovators who vend in some of the world's most competitive markets.

When public policies of the patent system are at issue, the Conejo Valley Bar Association regularly participates as *amicus curiae* in cases before the Court and *en banc* panels of the Court of Appeals for the Federal Circuit. We are unconcerned with the outcome of the cases, though decidedly concerned about the issues. We wish to see the American public benefit from innovation, from technical disclosure, and from competition in product and service markets. In short, we support the purpose of the patent system. The Conejo Valley Bar Association believes that the patent laws should be interpreted in ways that best serve these important public policies.

---

[1] Pursuant to Supreme Court Rule 37.6, Amicus states that no counsel for a party authorized this brief in whole or in part and that no person or entity other than Amicus, its members, and its counsel contributed monetarily to the preparation or submission of this brief. On December 11, 2013, counsel for the respondents and counsel for the petitioner consented to the filing of amicus curiae briefs, in support of either party or of neither party. With the consent of the parties, the Conejo Valley Bar Association submits this brief *amicus curiae* in support of neither party.

INTRODUCTION AND SUMMARY OF ARGUMENT

The underlying purpose of patent law is to encourage the development of inventions that provide value and benefit for society. The Patent Act makes clear that any new and useful process, machine or article of manufacture is patent-eligible. Whether software is claimed as a method (process), a computer/system (machine) or manufacture (storage medium) is irrelevant. None of these broad categories is "abstract" and, therefore, all are inherently patent-eligible. As a result, any new test to determine which kinds of software are patentable under § 101 is unnecessary. Unless other sections of the Patent Act prevent a patent's issuance, all software, whether claimed as a process, machine or article of manufacture, is patentable.

Instead, through scrupulous application of other key provisions in the Patent Act, especially 35 U.S.C. §§ 102 (novelty), 103 (obviousness) and 112 (specification), the Patent and Trademark Office and the courts protects the public from software patents that seek to take too much from society. These other provisions of the Patent Act, not § 101, serve as more than adequate gatekeepers to restrict patents to new, novel and unobvious inventions that meet the requirements of all provisions in the Patent Act. In particular, these other provisions of the Patent Act already provide an adequate measure of whether a claimed invention is "abstract" because abstract ideas are inherently in the prior art.

Therefore, if a patent or patent application passes muster under all provisions of the Patent Act, the inventor can have a patent – but only for the "limited times" of the grant mandated by the Constitution and embodied in 35 U.S.C. § 154. Limiting the form of patent-eligible software will reduce the incentive to patent and decrease the number of patentable inventions, causing vital and important inventions to be lost or otherwise secreted from society contrary to the purpose of patent law.

ARGUMENT

"The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in 'Science and the useful Arts.'"[2] "The public interest, of course, favors the maintenance of a well-functioning patent system."[3] The Court's "statutory subject matter" jurisprudence has made this impossible. In trying to solve the problem of bad patents, the Court has set loose a massive Category F5[4] tornado, leaving random carnage and uncertainty in its path. As Judge Rader said in the Federal Circuit *en banc* decision leading up to this case, one must "consult the statute!"[5] to understand the proper place of § 101 in the Patent Act.

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[2] *Mazer v. Stein*, 347 U.S. 201, 219 (1954).

[3] *Medtronic v. Mirowski Family Ventures, LLC*, 571 U.S. ___ (2014).

[4] In the immortal words of Amblin Entertainment's 1996 film, *Twister:*

> Bill Harding: It's the Fujita scale. It measures a tornado's intensity by how much it eats.
> Melissa Reeves: Eats?
> Bill Harding: *Destroys*.
> Brian Laurence: That one we encountered back there was a strong F2, possibly an F3.
> [. . .]
> Melissa Reeves: Is there an F5? What would that be like?
> Jason 'Preacher' Rowe: The Finger of God.

[5] *CLS Bank Int'l. v. Alice Corp.*, 717 F.3d 1269, 1335 (Fed. Cir. 2013) (*en banc*) (Rader, C.J., Additional Reflections)

I. Limiting the Kinds of Patentable Processes Can Only Be Overreaching Judicial Legislation

It is within the purview of Congress to change what constitutes patentable subject matter.[6] This is not a judicial task. Such is the case here. The Court is faced with deciding whether claims to computer-implemented inventions are directed to patentable subject matter under § 101. In deciding this issue, the Court needs merely to rely on the Patent Act. The broadness of § 101 is limited by the gatekeeper provisions of §§ 102, 103 and 112. Unnecessarily limiting § 101 likely will damage a significant part of the U.S. economy.[7] Section 101 was intended to be interpreted broadly and the Court should reinforce such an understanding.

Any tests by the judiciary to limit processes deemed patentable are directly contrary to the language and intent of the Patent Act. The Patent Act says what it means and means what it says when it states that a patent may be obtained for "**any** new and useful process, machine, and article of manufacture or composition of matter."

---

[6] In addressing changes to the Copyright Act, the Court reached the same conclusion: "The [Copyright Term Extension Act] reflects judgments of a kind Congress typically makes, judgments we cannot dismiss as outside the Legislature's domain." *Id*. at 205.

[7] *CLS Bank v. Alice Corp.*, 717 F.3d at 1313 (Moore, J., dissenting-in-part) (stating that under the reasoning of the plurality opinion, 320,799 patents granted from 1998-2011 would presumably also be invalid).

The Patent Act does not recite that only chemical processes or machine-based processes may be patented, and the Act does not recite that business methods and software may not be patented. It simply recites that "**any** new and useful process, machine, article of manufacture or composition of matter" may be patented.

Nothing in the Patent Act or its history hints that the kinds of inventions that are patentable subject matter should be less than "any."

Reading limitations that Congress did not intend into the statute risks stifling instead of encouraging innovation. Inventors and investors need encouragement to invest in research and innovation. They should know their successful research and innovation will be rewarded. Limiting the ways in which an inventor can claim software and software-related inventions hinders inventors from passionately pursuing their ideas since there would be no reward for investing time, capital, resources and effort in pursuing their innovative ideas.

The Patent Act reflects a balance created by Congress between public and private interests, one which this Court has been loath to alter.[8] Excluding software inventions from patentability or requiring that inventions be claimed in specific forms, forces companies to maintain more valuable knowledge in secrecy. This will decrease the pool of prior art and will create little incentive for inventors to disclose their inventions. The underlying Constitutional purpose of the patent system and Congress' balances will be upset. "Calibrating rational economic incentives, however, like fashioning new rules in light of new technology is a task primarily for Congress not the courts."[9]

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[8] *See Stewart v. Abend*, 495 U.S. 207, 230 (1990) ("[I]t is not our role to alter the delicate balance Congress has labored to achieve").

II. The Statutory Language of § 101 and the Legislative Intent Support a Broad Interpretation of § 101's Processes, Machines, Manufactures and Compositions of Matter

The Constitution grants Congress broad power to legislate to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[10] The Constitution expresses a public policy of promoting innovation. In exchange for innovation, the inventor receives the exclusive right to commercialization of the claimed invention for a limited time.

Abraham Lincoln stated in his "Second Lecture on Discoveries and Inventions":

> Next came the Patent laws. These began in England in 1624; and, in this country, with the adoption of our constitution. Before then, any man might instantly use what another had

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[9] *Eldred v. Ashcroft*, 537 U.S. 186, 207 (2003).

[10] *Diamond v. Chakrabarty*, 447 U.S. 303, 307 (1980) (citing Art. I, § 8, cl. 8).

> invented; so that the inventor had no special advantage from his own invention. The patent system changed this; **secured to the inventor, for a limited time, the exclusive use of his invention; and thereby added the fuel of interest to the fire of genius, in the discovery and production of new and useful things.** (emphasis added)

The Patent Act embodies these ideals by striking a careful balance between competing public and private interests in order to promote innovation. In this regard, the statute promises:

> Whoever invents or discovers **any new and useful process, machine, manufacture**, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.[11,12]

The central inquiry in this case turns on how broadly to construe "*process,*" "*machine,*" and "*manufacture,*" when determining what constitutes patentable subject matter. This Court in *Bilski v.*

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[11] 35 U.S.C. § 101 (emphasis added).

[12] Citations herein are to the Pre-AIA Patent Act. Amendments to the Patent Act have been made in these sections, but as the case is based upon several Pre-AIA patents, Pre-AIA citations have been used. Changes under the AIA are not significant to this case.

Kappos[13], *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*[14] and in *Diamond v. Chakrabarty*[15] recognized that § 101 has broad scope.[16] The Court in *Chakrabarty* stated:

> The subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting "the Progress of Science and the useful Arts" with all that means for the social and economic benefits envisioned by Jefferson. Broad general language is not necessarily ambiguous when congressional objectives require broad terms.[17]

In the middle of the nineteenth century, the Court stated: "[A process] is included under the general term 'useful art'. An art may require one or more processes or machines to produce a certain result or manufacture."[18] Many years later, the Court explained: "A process is an act or mode of acting, . . a conception of the mind, seen only by its effects when being executed or performed."[19] Though these cases do not address the term "process" in § 101, they demonstrate the historically broad interpretation of § 101.

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[13] *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2009).

[14] *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124 (2001).

[15] *Chakrabarty*, 447 U.S. at 303.

[16] *J.E.M. Ag Supply, Inc.*, 534 U.S. 130-131.

[17] *Chakrabarty*, 447 U.S. at 315.

[18] *Corning v Burden*, 56 U.S. 252, 267 (1854).

[19] *Tilghman v. Proctor*, 102 U.S. 707, 728 (1881).

In addition, the legislative intent calls for a broad interpretation of § 101. In *Chakrabarty*, the Court noted that by choosing expansive terms such as "manufacture," "compositions of matter" and the comprehensive modifier "any" in § 101, Congress intended that the patent laws would receive broad scope.[20] Similarly, Congress' intent in choosing an expansive word such as "process" ensured that § 101 would be construed broadly for processes that could be patented.

Section 100(b) also supports a broad construction of "process." The section states that "process" "means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."[21] If Congress intended a narrow interpretation of "process," it could have defined the term with limiting language. However, Congress nowhere expressed such intent. Instead, §§ 100(b) and 101 use expansive language to define "process." Thus, any narrow interpretation of § 101 is contrary to its language.

The Court in *Chakrabarty* also explained that the legislative history supported a broad construction of the § 101.[22] In particular, the Court stated:

> The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful

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[20] *Chakrabarty*, 447 U.S. at 308.

[21] 35 U.S.C. § 100(b).

[22] *Chakrabarty*, 447 U.S. at 308.

> art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]." The Act embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." Subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language. In 1952, when the patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left Jefferson's language intact. The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to **"include anything under the sun that is made by man."**

Even more recently, the Court declined to impose limitations on the meaning of "process" in 35 U.S.C. § 100(b).[23] The Court also made clear that the machine-or-transformation test was insufficient to act as the sole arbiter of whether a "process" was statutory.[24] Instead, the Court held that "the § 101 patent-eligibility inquiry is only a threshold test."[25]

Thus, an examination of the patent laws and the legislative intent all indicate that § 101 ensures that any process, machine or manufacture is patentable so long as it withstands the Patent Act's other requirements.

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[23] *Bilski*, 130 S. Ct. at 3128.

[24] *Id.*at 3226.

[25] *Id.* at 3225.

III. The Patent Act Already Limits What Inventions May Be Patented

Instead of the courts inventing their own restrictions on patentable subject matter through interpretation of § 101, the public policy of promoting innovation is best served by allowing the rest of the Patent Act, namely §§ 102, 103 and 112[26], to serve as the proper gatekeeper limiting those processes meriting a patent.

a. Inventions Must Be Novel

Section 102 describes the statutory novelty required for patentability:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country more than one

---

[26] *Id.* at 3229. ("[Sections 102, 103 and 112] serve a critical role in adjusting the tension, ever present in patent law, between stimulating innovation by protecting inventors and impeding progress by granting patents when not justified by the statutory design.").

> year prior to the date of application for patent in the United States. . .[27]

In *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*,[28] the Court stated:

> Sections 102(a) and (b) operate in tandem to exclude from consideration for patent protection knowledge that is already available to the public. They express a congressional determination that the creation of a monopoly in such information would not only serve no socially useful purpose, but would in fact injure the public by removing existing knowledge from public use.[29]

Further, in *Pfaff v. Wells Elecs., Inc.*[30] the Court stated:

> Consistent with these ends, § 102 of the Patent Act serves as a limiting provision, both excluding ideas that are in the public domain from patent protection and confining the duration of the monopoly to the statutory term.

---

[27] 35 U.S.C. § 102(a) and (b); see also *In re Bergstrom*, 427 F.2d 1394, 1401 (C.C.P.A. 1970) (holding "[T]he criteria for determining whether given subject matter is 'new' within the meaning of § 101 are no different than the criteria for determining whether that subject matter possesses the 'novelty' expressed in the title of § 102.

[28] 489 U.S. 141 (1989).

[29] 489 U.S. at 148.

[30] 525 U.S. 55 (1998).

That is, § 102 ensures that even subject matter patentable under § 101 nonetheless may not deserve patent protection because the subject matter is not "novel" under § 102. Thus, § 102 serves as an important constraint that ensures not *all* patent-eligible subject matter receives patent protection.

b. Patentable Inventions Cannot be Obvious Variations of the Prior Art

Section 103's "nonobviousness" requirement further limits patent protection to material that cannot be readily created from publicly available material.[31] Specifically, § 103(a) forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."[32] Thus, subject matter patentable under § 101 may not receive patent protection when it is incapable of withstanding the nonobviousness requirements of § 103. In this way the Patent Act provides another significant limit on the broad term "process" used in § 101.

The Court's recent decision in *KSR* further protects the public from the over breadth concerns that may arise from construing § 101 patent eligibility broadly:

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[31] *Bonito Boats* at 150.

[32] *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007), *quoting* 35 U.S.C. § 103.

> The principles underlying these cases are instructive when the question is whether a patent claiming the combination of elements of prior art is obvious. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.[33]

As technologies continue to advance, the threshold used to determine whether the innovation is ordinary or nonobvious continues to escalate.[34] Specifically, the Court stated:

> We build and create by bringing to the tangible and palpable reality around us new works based on instinct, simple logic, ordinary inferences, extraordinary ideas, and sometimes even genius. These advances, once part of our shared knowledge, define a new threshold from which innovation starts

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[33] *Id.* at 417.

[34] *Id.* at 427.

> once more. And as progress beginning from higher levels of achievement is expected in the normal course, the results of ordinary innovation are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of useful arts. See U.S. Const., Art. I, § 8, cl. 8. These premises led to the bar on patents claiming obvious subject matter established in Hotchkiss and codified in § 103. **Application of the bar must not be confined within a test or formulation too constrained to serve its purpose.**[35]

As the Court recognized in *KSR*, by imposing constraints, we risk not achieving the fundamental purpose of the patent law. Just as the "teaching, suggestion, motivation" (TSM) test for nonobviousness which the Court rejected in *KSR* as too constraining, a narrow interpretation of § 101 also will be too constraining when deciding what constitutes patentable subject matter.

c. The Patent Act Requires Full Disclosure of the Invention

Section 112 limits patents to those that provide full disclosures of the inventions:

> The specification shall contain a written description of the invention, and of the manner and process of making and

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[35] *Id.* (emphasis added).

> using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.[36]

Thus, through § 112, Congress limited patent protection to those patents having a clear and complete description of the invention. The patent must provide enough description to enable others to make and use the invention. And the patent must disclose the best mode of carrying out the invention. These requirements ensure that patentees do not receive overly broad scope in patent protection. Instead, patentees receive protection only for what they *really* invented. Consequently, the public receives a full and fair disclosure in exchange for the limited protection afforded by a patent.

d. Inventions must be Definite

Section 112, ¶ 2, places further limits on patentability by requiring the patentee to "particularly point out and distinctly claim the subject matter which the inventor regards as carrying out his invention." Complying with section 112 requires patentees to definitively identify the subject matter being claimed. Through this section, Congress evinced an intent that the claims be clear about what subject matter is within the scope of the claim.

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[36] 35 U.S.C. § 112, ¶ 1.

Claims that are "abstract," or lack definitive limitations, fail to meet the burden imposed by Section 112, paragraph 2, because they fail to put the public on notice as to the actual scope of the claims. Such claims, properly understood, are not attempts to claim patent ineligible subject matter — the subject matter remains patent eligible. Instead, they are attempts to claim so broadly or obliquely that the applicant/patentee fails to "particularly point out and distinctly claim" the subject of the claims under § 112. After a threshold inquiry regarding § 101, § 112, ¶ 2 addresses claims that are too broadly written.

e. Inventions Must Be Useful

In *Brenner v. Manson*[37], the Court explained:

> The basic *quid pro quo* contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility. Unless and until a process is refined and developed to this point - where specific benefit exists in currently available form - there is insufficient justification for permitting an applicant to engross what may prove to be a broad field.[38]

Section 101 explicitly limits patent protection to inventions with utility by requiring, "Whoever invents or discovers any new and *useful* process, machine [or] manufacture " should be entitled to patent protection.[39] As such, § 101 does not allow all inventions to receive patent protection -- only those that provide some *utility*. The Court in *Brenner* recognized that allowing inventors to receive a patent on a process that has no utility would enable inventors to obtain a hunting license.[40] That is, it would reward them merely for searching for some invention, regardless of whether the invention provided any benefit to the public.[41] This utility requirement is another constraint on patentable subject that is built into § 101.

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[37] *Brenner v. Manson*, 383 U.S. 519 (1966).

[38] *Id.* at 534-35.

Therefore, *any* process, machine, article of manufacture or composition of matter may constitute patentable subject matter, but it will receive patent protection only if it meets all other requirements of the Patent Act, including §§ 102, 103 and 112. The gatekeeper provisions of §§ 102, 103 and 112 reward true innovation by allowing that only worthy advances in the broad patentable subject matter of § 101 are granted patents.

IV. The Twenty Year Term is an Absolute Limit on Any Patent that Overcomes the Hurdles of Novelty, Nonobviousness and Disclosure

Patents are not diamonds; they do not last forever. They are more like cabbage, which takes some time to grow, but will eventually return to base organic matter. In time, patents expire. Through the simple mechanism of expiration, the framers in the Constitution and Congress in the Patent Act provided absolute limits on what is patented. Under § 154, most patents expire twenty years after the inventor first applied for patent protection. Thus, even if an invention passes the novelty, nonobviousness and usefulness tests, and the patent specification satisfies the disclosure requirements, no matter how big or small the invention, the patent will expire.

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[39] 35 U.S.C. § 101

[40] *Brenner*, 383 U.S. at 534-35.

[41] *Id.*

The PTO's published statistics demonstrate that examination of applications for patents in some areas of technology take longer than applications in other areas. Congress and the PTO through resource allocation have in effect controlled the patent term of different types of inventions. The time from filing of a patent application to its grant for business methods has historically been some of the longest. Pendency grows for many different reasons. The PTO's own backlog leads to deferral of the start of examination on many patent applications. PTO procedures requiring several patent examiners to review allowance of patents in some fields has also delayed the grant of patents and limited the scope of their claims. Although informal, these procedures suppress some types of patents and, at times, have been particularly effective against software-related applications. This is long-standing practice and one that Congress can control. Court intervention is unnecessary.

CONCLUSION

In sum, a broad interpretation of § 101 is essential to maintain the public policy of promoting innovation. If an invention passes the tests Congress established in §§ 102, 103 and 112, it is patentable. The Patent Act neither expresses nor mandates any further test. "[T]he applicant whose invention satisfies the requirements of novelty, nonobviousness, and utility, and who is willing to reveal to the public the substance of his discovery and 'the best mode . . . of carrying out his invention,' is granted 'the right to exclude others from making, using, or selling the invention throughout the United States' for a limited time."[42] Accordingly, the public policy of promoting innovation is best served by maintaining the entire breadth of § 101 intended by Congress. Let §§ 102, 103, and 112 remain the primary limitations on all patentable subject matter.

For the foregoing reasons, we, the Conejo Valley Bar Association, urge the Court to construe § 101 broadly and find that claims directed to systems, machines, processes and items of manufacture are all patent-eligible, subject to the other limitations imposed by the Patent Act. Furthermore, we urge the Court not to place any additional limit on the form in which software may be claimed, and to overrule any prior limitations that exist, except those already expressed in the Patent Act.

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[42] *Bonito Boats*, 489 U.S. at 150 (citation omitted).

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ALICE CORPORATION PTY. LTD.,
Petitioner,
v.

CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,
Respondents.

**On Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit**

BRIEF OF *AMICUS CURIAE* DALE R. COOK, *PRO SE*, IN SUPPORT OF PETITIONER

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QUESTION PRESENTED

Whether claims to computer-implemented inventions-including claims to systems and machines, processes, and items of manufacture-are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

PARTIES TO THE PROCEEDING

All parties to the proceeding are identified in the caption.

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INTEREST OF *AMICUS CURIAE* [1]

Dale Cook, *Pro Se Amicus*, the real party in interest, an attorney licensed by Texas (1992) and Washington (2001), filed an *Amicus* brief in the court below, and at the Petition Stage.

SUMMARY OF ARGUMENT[2]

In times past, electrical-engineer patent attorneys patent-claimed Information Age ("InfoAge"), and in particular Intelligence Amplification ("IntellAmp"), technologies like Alice's but they did so in terms of the actual electronic circuits (*e.g.*, Resistor-Transistor Logic circuits) which were assembled, activated, and operated via a large number of sequences of voltages that were sequentially impressed in parallel to the pins of a type of Integrated Circuit ("IC") (*e.g.*, a "general purpose processor"). The practice was that the electrical engineer would receive the large number of sequences of voltages to be impressed upon the processor in the form of a medium such as magnetic oxide (*e.g.*, computer tape drive or hard disk drive)—a stored computer program. In view of the state of the law, the electrical engineer patent attorney, on behalf of his client (*e.g.*, the Integrated Circuit Banking Machine Corporation ("ICBM")) would then work with engineers/programmers to determine/synthesize the circuits created/likely created by the computer program as its voltages were applied to the pins of the IC (processor) to find those electronic circuits in the sequence of assembled circuits that represented the most commercially valuable results arising from the computer program.

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[1] No counsel for a party authored this brief in whole or in part, and no party or counsel for a party made a monetary contribution intended to fund the preparation or submission of this brief. No one other than *amicus curiae*, its members, or its counsel made a monetary contribution to the preparation or submission of this brief. Parties have consented to *Amicus* briefs.

[2] *Amicus* notes that Sections I-III below (technology-centric) and Section (IV (legal centric) may be read in either order depending upon preferences.

The electrical-engineer patent attorney would then claim variants of those activated electronic circuits. These claims were insanely hard to parse, and in no way abstract, and they met all legal requirements. And they were valuable to the attorney's client.

But . . . it was very labor intensive for a person reading such claims to know what they covered in the real commercial world if they did not already know, at the front end, what human-semantic logic the circuits worked to mimic. Not a great system for judges and the public, but great for the people who knew the legally required "encryption algorithm," provided by the electrical engineer in the employ of the client. That is, the attorney's client (ICBM) knew what commercial activity was being infringed, but it was a high intensity exercise (but doable) for anyone else to know exactly what commercial activity was being infringed by legal instruments drafted in the working vocabulary of electrical engineers. And this had the added benefit of making electrical-engineering patent attorneys immune from legal malpractice lawsuits—a special type of lawyer, "above the law"—because no one could understand the claims well enough to claim attorney error should something go wrong in assertion.

Then . . . the Court of Appeals for the Federal Circuit (CAFC) changed everything, creating a "CAFCInformationAge Test"—defined by three seminal cases: *In re Alappat*, 33 F.3d 1526 (Fed. Cir.

1994), *AT&T Corp. v. Excel Communs.*, 172 F.3d 1352 (Fed. Cir. 1999), and *State Street Bank & Trust Co. v. Signature Fin. Group*, 149 F.3d 1368, 1373 (Fed. Cir. 1998)—that allowed the complex electrical engineering subject matter to be claimed in natural English language that described the commercially valuable results arising from the complex electrical engineering subject matter. In tandem with that law, and as shown herein, the CAFC also created its Markman Jurisprudence, *Markman v. Westview Instruments*, 52 F.3d 987 (Fed. Cir. 1995), which this Court validated in *Markman v. Westview Instruments,* 517 U.S. 370 (1996), which when paired with the CAFCInformationAge Test allowed a reviewing Federal Judge to construe the broad legal contours of the claim in terms of its commercially valuable end results (Markman Phase 1—construing the legal instrument) prior to actually engaging the incomprehensibly-complicated electronic-engineering technologies of the Information Age (Markman Phase 2—consulting electronic engineers/programmers as to what machines-processes, articles-of-manufacture were meant by the natural English language of the patent claims). With respect to Information Age technologies, this allowed the reviewing Federal Judge to handle the major legal issues first, but without ever having to wade into the mind-warping electronic engineering technologies, which he ordinarily would have had to do before the CAFCInformationAge Test.

For example, due to the fact that the CAFCInformationAge Test allows claiming of the commercially valuable results in plain English—rather than volts, amps, resistance, timing diagrams, transistors, capacitors, etc.—a judge can determine in a first stage whether the defendant is not liable—

under either direct (35 USC 271(a)) or vicarious (35 USC 271(b)-(c)) infringement theories—on the law alone. For example, because (a) as a matter of law no single legal entity can practice the claim as drafted, *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318 (Fed. Cir. 2008)[3] , (b) as a matter of law the claim as drafted is invalid as indefinite, *IPXL Holdings v. Amazon.com*, 430 F.3d 1377 (Fed. Cir. 2005); *Katz Interactive v. Am. Airlines*, 639 F.3d 1303 (Fed. Cir. 2011))[4], or (c) as a matter of law the defendant is not liable in that the claim as drafted is not infringed via the defendant's use of the multi-sovereign gambit, *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282 (Fed. Cir. 2005).[5] Thus, by allowing the judge to handle the major legal issues first, the CAFCInformationAge Test freed up crucial judicial resources that would otherwise have been wasted wading into the electronics and operations to reach the legal issues.

For like reasons, since a non-electrical-engineer attorney can likewise read the claim, notice to the public is also further improved.

Thus, the CAFCInformationAge Test paired with the Markman jurisprudence allowed/required the patent attorney to claim in terms of commercially valuable results thus improving the lives of both the working federal judges and the public.[6]

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[3] ("Thomson neither performed every step of the claimed methods nor had another party perform steps on its behalf, and Muniauction has identified no legal theory under which Thomson might be vicariously liable for the actions of the bidders. . . . Thomson does not infringe the asserted claims as a matter of law.")

[4] *Amicus* Cook Br. 28-33.

[5] *Id.*

CLS Bank (the financial industry) would undo all that by sending us back to times past, where claims such as Alice's would be in the form of the machines, machine-states, and machine-state transformations that create the DATA which constitute the INFORMATION that is the commercially valuable results.

Electrical engineers, computer engineers, and even a handful of computer scientists, can claim in that way, but does the Court really want that?

If not, then this Court should adopt the CAFCInformationAge Test as A machine-or-transformation test appropriate to the Information Age ("InfoAge"), in general, and Intelligence Amplification ("IntellAmp") technologies in particular.

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[6] However, the seminal cases forming the CAFC InformationAge Test appear unclear due to the vocabulary that existed to describe the technology at the time they were decided. As shown herein, a newer formal DATA-INFORMATION vocabulary can be applied to these seminal cases to clarify that they form a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies.

I. A Complex Question Implying A False Dilemma—Either-Or Choice Between Software ("Not Hardware") And Hardware—Used To Argue That "Software" Matches A Definition Of "Abstract"; and a False (Neglected) Cause Used to Argue that Alice Lays Claim to Human Thinking Rather than to Machines/Machine-States/Machine-State Transformations Carefully-Engineered to Create DATA (Humanly-Perceivable Differences) Designed to Cause INFORMATION (Human Thinking)

CLS Bank (the financial industry) has convinced the courts that some of the most complex and power-intensive electrical circuitry and electrical circuitry operation known to mankind are somehow disembodied "abstract ideas."[7] How could that be?

There is precedent of this Court that yields a simple formula having the desired outcome (e.g., Alice's patent claims held invalid as drawn to patent ineligible subject matter with nary so much as a claim construction):

> The categories of patent-eligible subject matter [—"process, machine, manufacture, or composition of matter"—] recited in § 101 . . .[are] limited by . . . judicially created exceptions. ". . . abstract ideas" are excluded from patent eligibility, *See Diamond v. Diehr*, 450 U.S. 175, 185, 101 S. Ct. 1048, 67 L. Ed. 2d 155 (1981), . . . *Gottschalk v. Benson*, 409 U.S. 63, 67, 93 S. Ct. 253, 34 L. Ed. 2d 273 (1972). Thus, even inventions that fit

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[7] Does charging a smartphone, notebook computer, or a desktop computer connected to the industrial power grid seem abstract?

> within one or more of the statutory categories are not patent eligible if drawn to . . . an abstract idea. . . .
>
> . . . If the invention falls within one of the statutory categories, we must then determine whether any . . . judicial exceptions nonetheless bars such a claim—is the claim drawn to a patent in-eligible . . . abstract idea? If so, the claim is not patent eligible. Only claims that pass both inquiries satisfy § 101.

CLS Bank Int'l v. Alice Corp. Pty, 717 F.3d 1269, 1276-1277 (Fed. Cir. 2013).

Formulaically, IF subject matter of claims can be made to match the definition of "abstract idea" in this precedent, THEN the claims are to "patent-ineligible" subject matter, and the "claim is not patent eligible". *Id.*

The financial industry has used three effective tools to make Alice's technologies match up with the definition of abstract ideas in this context,[8] thereby creating rhetoric that Alice's technologies constitute "unpatentable subject matter": (i) a complex question that presupposes some inchoate "invention" (e.g., some ineffable "software") somehow "implemented" in a "computer," said presupposition implying; (ii) a false dilemma (either-or choice between software ("not hardware") and hardware) used to construct an argument that "software" matches the dictionary definition of "abstract," when software is actually an engineering term used to distinguish the design choice of using computer programs to create special purpose circuits from reconfigurable but slower hardware versus the design choice of using circuit manufacturing techniques to create non-reconfigurable (but much faster) hardware; and (iii) a false (neglected) cause argument—confusing DATA (machine-generated differences above the threshold of human perception) for the INFORMATION (human thought, or mental states)—such DATA are designed to cause, and through such confusion arguing that Alice's claims are drawn to mental steps.[9] [10]

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[8] *See*, e.g., abstract ideas of *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1342-1343 (Fed. Cir. 2013) ("Members of both the Supreme Court and this court have recognized the difficulty of providing a precise formula or definition for the abstract concept of abstractness. . . . ('The Court . . . [has] never provide[d] a satisfying account of what constitutes an unpatentable abstract idea.')" (quoting, Stevens J., concurring, *Bilski v. Kappos*, 130 S. Ct. 3218, 177 L. Ed. zd 792 (2010)) and CLS *Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269, 1292 (Fed. Cir. 2013) (". . . abstract ideas—mental steps.").

Regarding the complex question and false dilemma argument, there is no inchoate "invention" (e.g., some ineffable "software") somehow "implemented" in a "computer." Software is an engineering term differentiating the use of slower reconfigurable hardware from faster non-reconfigurable hardware. Software is not abstract. Software and hardware are functional design equivalents.

Regarding the false (neglected) cause argument, IntellAmp patents do not lay claim to either first-order or second-order human thought. Rather, ***IntellAmp patents, like Alice's, lay claim to machines/machine-states/machine-state-transformations carefully engineered to create***

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[9] *Aristotle*, Sophistical Refutations Book I, Parts 1 and 4

[10] *Encyclopedia Britannica Online*, describing Aristotle's *Sophistic Refutations*:, accessed January 08, 2014, http://www.britannica.com/EBchecked/topic/200836/fallacy

structured DATA (machine-generated-tangible-differences),[11] ***said DATA structured in view of*** FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION (e.g., English language words which have concrete meaning to English-readers), ***and said DATA further structured in view of*** SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION (e.g., desired result of understood and humanly-useful currency trading concepts which the English reader gleans from the English words of Alice's IntellAmp claims). In IntellAmp technologies DATA (machine-generated-tangible-differences) are not thinking; rather, U.C. (machine-generated-tangible-differences) are structured to trigger, or cause, human thinking. ***IntellAmp patent claims are to machines that produce DATA, not to the thinking/meaning—INFORMATION—such DATA are structured to trigger in humans***.

All "abstract" arguments are false. The Court should hold Alice's claims are drawn to patent eligible subject matter because "software" is not abstract, and IntellAmp technologies use machines to create machine-generated-differences (DATA) structured to trigger human meaning/thinking and thus Alice's claims are to machines that produce DATA, not the human thinking such DATA might trigger.

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[11] "Tangible" meaning perceivable by humans via some technology such as voltmeter measurements, pixel brightness differences (LCD monitor), haptic differences (cell phone on vibrate), audio differences (cell phone with audible ringtone), etc.

II. A Complex Question Implying a False Dilemma: An Either-Or Choice Between "Hardware" and "Not Hardware" ("Software") Used To Construct An Argument That "Software" Matches A Definition Of "Abstract" And Is Thus Unpatentable, When In Fact "Software" is A Term to Distinguish the Design Choice of Reconfigurable (But Slower) Hardware from the Design Choice of NON-Reconfigurable (But Much Faster) Hardware

The financial industry has been able to generate confusion by the exploitation of a false choice between "hardware" and "software" ("not hardware") which has been deftly inserted into the Question Presented. This dilemma is false, and the Question Presented should be understood consistent with the technology.

The Question Presented recites "whether claims to computer-implemented inventions-including claims to systems and machines, processes, and items of manufacture . . ." The phrase "computer-implemented inventions" implies that there is some inchoate and disconnected "invention" which is just somehow "implemented" in a "computer."

The phrase "claims to computer-implemented inventions . . ." appears calculated to create the appearance of a "split nature" of such claims. By using "computer-implemented" as an adjective that is appended to "invention," a "computer" (*e.g.*, a hardware microprocessor) is made to seem like a generic or neutral component of "something else" (*e.g.*, "not hardware" ("software")) that "is" the "invention."

Why does this matter? Because when mischaracterized in this way—"software" as "not hardware"—but otherwise ill-defined, "not hardware" matches up with "abstract idea": "disassociated from any specific instance . . . expressing a quality apart from an object <the word poem is concrete, poetry is [abstract]>"). An abstract idea is one that has no reference to material objects or specific examples—i.e., it is not concrete." *Ultramercial* at 1342–43. This "similarity" leads to the conclusion that, as an abstract idea, "software" is unpatentable. But the hardware-software ("not hardware") dichotomy used to generate this "similarity" is false.

As shown below, what is called "software" is actually use of computer programs to create special purpose circuits from reconfigurable but slower hardware, and what is called "hardware" is actually use of circuit manufacturing techniques to create non-reconfigurable but much faster hardware.

In the absence of the false dichotomy "software" is patent eligible because electronic and computer engineers understand "software" as "slower hardware;" that is why a computer program can be converted to faster non-reconfigurable hardware as shown following.

III. Question Presented Should Be Understood In View of the Actual Technology–What is Called "Software" is Actually Use of Computer Programs to Create Special Purpose Circuits from Reconfigurable but Slower Hardware, and what is Called "Hardware" Is Actually Use of Circuit Manufacturing Techniques to Create Non-Reconfigurable but Much Faster Hardware: "Hardware"-"Not Hardware" ("Software") Dichotomy is False—Hardware and Software, Properly Understood, Are Functional Design Equivalents[12]

Amicus shows following that the "hardware"—"software" ("not hardware") dichotomy is false, even when traditional microprocessor methodologies are used. However, more recent tools make proving the falsehood of the software-hardware dichotomy that much easier.

A. "Hardware"-"Not Hardware" ("Software") Dichotomy is False: NEC's Cyberwork-Bench Tool Accepts As Input a Program Written in the Higher Level Language C and Outputs Functionally Equivalent Non-Reconfigurable Hardware Design

NEC's Cyberworkbench accepts as input a program written in the higher level computer language C and outputs a non-reconfigurable hardware design which functions equivalently to the C program. The non-reconfigurable hardware design may be implemented in Application Specific Integrated Circuits (ASICs), which are non-reconfigurable circuits formed in silicon and metal.

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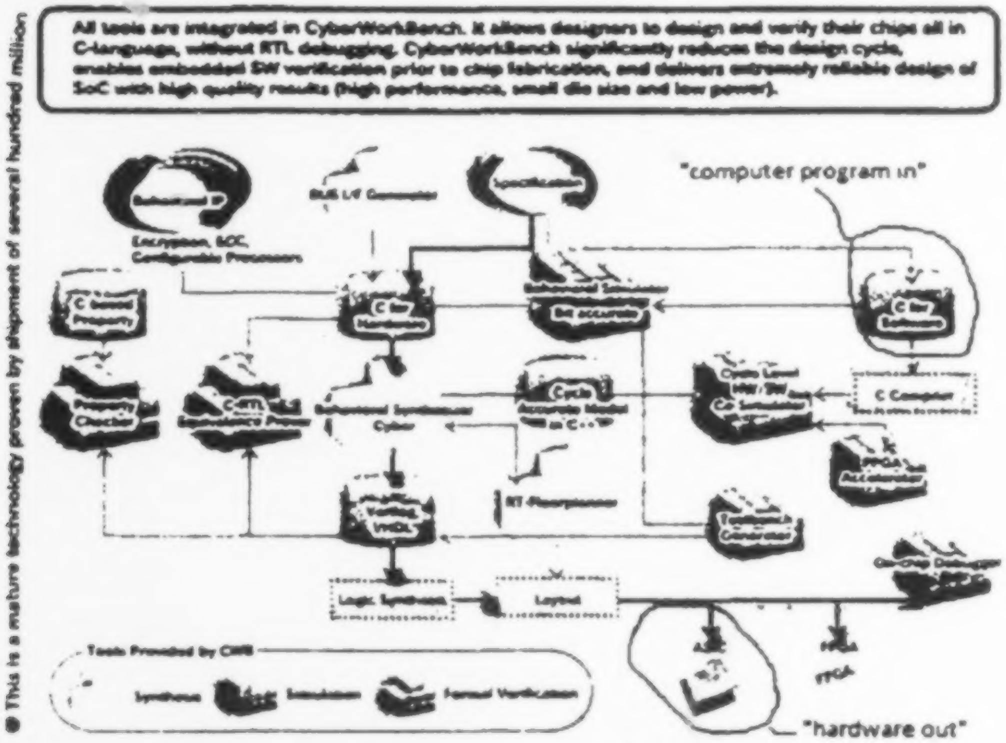
[12] Regarding all technology descriptions herein, please see Appendix A.

NEC's Cyberworkbench provides for direct translation of programs written in higher level computer languages direct to non-reconfigurable hardware (*e.g.*, ASIC hardware), thus directly demonstrating that the digital designs of computer programs (slower special purpose electronic circuits created from the reconfigurable electronic circuits of microprocessors via use of programs) may be equivalently implemented in non-reconfigurable electronic circuits (*e.g.*, ASICs).

NEC's Cyberworkbench datasheet illustrates its ability to convert a C program into a non-reconfigurable hardware equivalent. Shown (upper right) is the Cyberworkbench accepting as input a higher level programming language C program and producing as output (lower right) a non-reconfigurable hardware design:



All tools are integrated in CyberWorkBench. It allows designers to design and verify their chips all in C-language, without RTL debugging. CyberWorkBench significantly reduces the design cycle, enables embedded SW verification prior to chip fabrication, and delivers extremely reliable design of SoC with high quality results (high performance, small die size and low power).

© This is a mature technology proven by shipment of several hundred million
"computer program in"
Encryption, SOC, Configurable Processors
C for Hardware
C for Software
Bit accurate
C Compiler
FPGA Accelerator
Verilog VHDL
Logic Synthesis
Layout
ASIC
FPGA
Tools Provided by CWB
Synthesis
Simulation
Formal Verification
"hardware out"

For further information, please contact: info@cad.jp.nec.com

http://edatechforce.com/wp-content/uploads/2011/02/CyberWorkBench-Datasheet.pdf.

NEC Cyberworkbench depicts a computer program converted directly to equivalent non-reconfigurable hardware. The either-or hardware-software dilemma is thus seen to be false.

B. "Hardware"-"Software" ("Not Hardware") Dichotomy is False: Program Written in the Higher Level Language C May be Partially Implemented in Non-Reconfigurable Hardware and Partially Implemented In "Software" (*e.g.*, Special Purpose Electronic Circuits Assembled via Encoded Voltages of Computer Program Interacting With Reconfigurable Electronic Circuits of A Microprocessor/VLSIC)

Parkinson's Figure 1 and the associated text of their article *C to VHDL Converter in a Codesign Environment*, available at http://www.cse.unsw.edu.au/~sridevan/index_files/00323960.pdf, illustrate a computer program written in the higher level programming language C equivalently implemented in a working system composed of a combination of (i) NON-reconfigurable electronic circuits ("hardware" the right-hand path of Parkinson's Figure 1) and/or (ii) reconfigurable electronic circuits ("software"—special purpose electronic circuitries sequentially created by encoded voltages of a computer program interacting with the millions of recon-figurable electronic circuits provided by a VLSIC/microprocessor—the left-hand path of Parkinson's Figure 1).

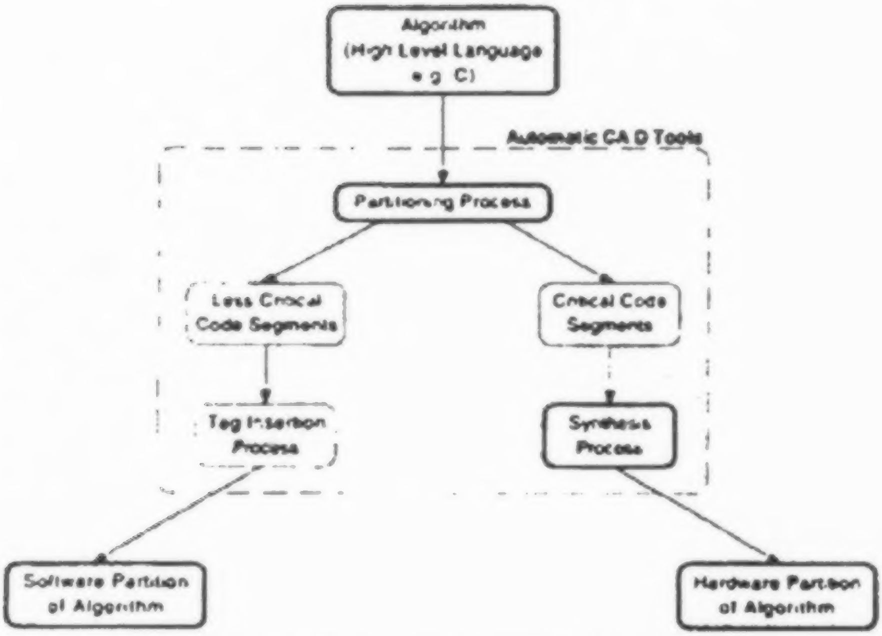

Algorithm
(High Level Language
e.g. C)
Automatic CAD Tools
Partitioning Process
Less Critical
Code Segments
Critical Code
Segments
Tag Insertion
Process
Synthesis
Process
Software Partition
of Algorithm
Hardware Partition
of Algorithm

Figure 1 - Automated Hardware/Software Codesign Methodology

For example, as explained in their article, tools such as C to Very-High-Speed-Integrated-Circuit Hardware Description Language (VHDL) converters accept as input a program written in the higher level computer language C, and produce as outputs files written in VHDL. The VHDL files are then input into logic synthesis tools which read the VHDL and output a non-reconfigurable hardware design. The non-reconfigurable hardware design may be implemented in ASICs, which are non-reconfigurable electronic circuits formed in silicon and metal.

The non-reconfigurable hardware can then be interfaced with the special purpose electronic circuits via the encoded voltages of computer programs interacting with the reconfigurable electronic circuits provided by a microprocessor/VLSIC to desired effect. For example, as explained by Parkinson et al, the parts of the C program for which speed is particularly important are implemented in non-reconfigurable hardware, while the parts where speed is not as critical are implemented in software (reconfigurable hardware under program control).

The "either-or" hardware-software dilemma is thus seen to be false. Hardware and software (programmatic use of slower but reconfigurable hardware) represent design choices that may in fact be combined.

C. "Hardware"-"Not Hardware" ("Software") Dichotomy is False: Program Written in the Higher Level Language C → Vendor-Specific Compiler → Binary Instructions for Vendor Specific Microprocessor/VLSIC = Voltages Applied in Parallel to the Pins of a Vendor-Specific VLSIC/Microprocessor To Assemble, Operate, and Save Outputs of Sequences of Hardware Designs at the Rate of Millions Per Second

In operation, a higher level computer language program, such as one written in the C programming language, is translated (compiled) into the binary instructions appropriate to the Instruction Set Architecture-microarchitecture of the vendor specific (*e.g*., Intel, NEC, AMD, etc.) microprocessor in use. These binary instructions actually represent voltages that are applied in parallel to the microprocessor.

To understand that the "hardware"-"software" dichotomy is false, it helps to keep in mind that a microprocessor is a Very Large Scale Integrated Circuit (VLSIC) having a collection of re-configurable (slower) circuit components activatable by applied voltages; ***in the absence of a program the VLSIC/microprocessor is inert***. It also helps to keep in mind that a "computer program" consists of encoded voltage levels that turn transistors on and off in a VLSIC/microprocessor; ***in the absence of the appropriate type of microprocessor/VLSIC a computer program is inert.***

Any digital logic design of a computer program, in order to work in the real world, must be such that it can compile to voltages that will work with the circuitries of a vendor specific microprocessor.

A microprocessor/VLSIC contains millions of electronic transistors and resistors. The VLSIC/microprocessor is engineered such that its electronic transistors can be selectively activated—just like flipping an on-off light switch in a room—to create special purpose analog electronic circuits which can accept electrical inputs and produce electrical output in ways that "mimic" or "stand in" for certain defined human-semantic logical operations. The defined human-semantic logical operations which a microprocessor's/VLSIC's special circuits can mimic are called "instructions." ***Taken together, the defined human-semantic logical operations and the hardware engineering of the VLSIC/ microprocessor that is necessary to produce the special circuits that when operated within engineering parameters can mimic the defined human-semantic logical operations are called the Instruction Set Architecture-micro-architecture ("ISA-microarchitecture") of the micro-processor/VLSIC. The ISA-micro-architecture is vendor specific***, so an Atmel microcontroller's ISA-microarchitecture is different than an Intel microprocessor's ISA-microarchitecture.

Activating and/or setting the inputs of the special purpose circuits which mimic the defined human-semantic logical operations ("instructions") of the VLSIC/microprocessor is typically done via voltages applied in parallel to metallic traces ("bit lines") which connect with metallic pins, each of which electrically connect with the VLSIC which make up the microprocessor. For example, with respect to the Atmel microcontroller, see *Amicus* D. Cook Br. 28-33, 8 voltages are applied in parallel to activate specific instructions of the Atmel microcontroller.

The circuits of the microprocessor/VLSIC are analog—as are all circuits—but are engineered in view of a special convention which allows the analog circuits to mimic human semantic digital logic. For example, in one type of circuit implementation ("Resistor-Transistor logic"), 0.0 to +0.8 measured volts, by convention, is treated as "standing for" human-semantic logical zero, and measured +2.0 to + 5.0 volts, by convention, is treated as "standing for" human-semantic logical one. The voltages can thus be "treated as" (encoded as) "strings" of "binary" symbols, but electrical and computer engineers understand that such strings specify voltage levels that open and close transistors of the VLSIC/ microprocessor to create or set the inputs of the special purpose circuits which mimic the human-semantic logic of the Instruction Set Architecture of the microcontroller/VLSIC.

Control of the circuitry of the VLSIC/microprocessor consists of a sequence of a number of encoded voltage levels—*e.g.*, a sequence of eight parallel voltage levels for the Atmel processor. When such a sequence is constructed to achieve a humanly useful and meaningful (concrete meaning to a human) output of circuits (tangible machines) and associated voltage transitions (transformations) via clever use of the special purpose electrical circuits-associated human-semantic instructions that make up the Instruction Set Architecture, such an encoded sequence of voltage levels is denoted as a "computer program." There is nothing abstract about a sequence of 8 voltages to be applied in parallel to metallic traces known as bit lines such as for the Atmel 8-bit processor.

Modern microprocessors/VLSICs can execute their instructions at the rate of millions per second. Since each instruction has an accompanying electronic circuit that "stands for" the human-semantic logic instruction, it follows that the computer programs are creating, using, and tearing down hardware designs (electronic circuits) from the electronic circuit components of vendor specific microprocessors/VLSICs at the rate of millions per second.

The either-or "hardware"-"software" dilemma is thus again seen to be false.

D. The Question Presented Should Be Viewed In Light of the Actual Technology—"Hardware" and "Software" Represent Functionally Equivalent Design Choices—"Software" is An Engineering Term Denoting Use of Computer Programs to Create Special Purpose Circuits from Reconfigurable but Slower Hardware, "Hardware" Is An Engineering Term Denoting Use of Circuit Manufacturing Techniques to Create Non-Reconfigurable but Much Faster Hardware

Amicus hopes the Court will recognize that engineers understand that the digital designs of higher order computer language (*e.g.*, C) programs can be equivalently implemented via general purpose microprocessor/VLSIC reconfigurable circuit techniques, non-reconfigurable circuit techniques (e.g., Application Specific Integrated Circuits), or some combination thereof (e.g. hardware software co-design such as detailed in above-described *C to VHDL Converter in a Codesign Environment*).

Properly understood, "software" is not abstract.

IV. A False (Neglected) Cause: Information "From Nothing" Versus Engineering Reality: IntellAmp Technologies Use Carefully Engineered Machines/Machine-States/Machine-State Transformations to Create DATA (machine-generated-tangible-differences) Structured In View Of FIRST-ORDER-Human-Thought-SYMBOL-INFORMATION (e.g., English Language Symbols Which Have Concrete Meaning To English Reader), And SECOND-ORDER-Human-Thought-CONCEPT-INFORMATION (e.g., Result Of Understood And Humanly-Useful Currency Trading Concepts Which Engineers Ultimately Hope To Trigger)

Regarding the neglected cause argument, things are slightly more complex. The Court is likely familiar with the mind-bending concepts of Semiotics—the study of signs as opposed to that which they signify, BUT there is yet a further distinction that arises in very precise semiotics as well as IntellAmp technologies: the distinction between the sign vehicle (one or more humanly-perceivable machine-generated differences—DATA), the sign (first-order human thought, e.g., DATA interpreted as English language words by humans who understand English—

FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION), and the signified (second-order human thought, e.g., such as would be understood from the English words of Alice's claims by English-readers who further work in the highly complex world of international currency trading -- SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION). Noth, *Handbook of Semiotics* 79-80 (1995).

Engineers usually work with "information" as that term is used in Shannon and Weaver's Mathematical Theory of Communication, traditionally referred to as "information theory," but better described as "data theory" outside of engineering as explained herein. As used by engineers, "information" is neither signifier (FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION) nor signified (SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION). Rather, it is "something else"—what precise semiotics calls the "sign vehicle": "In information theory, the term *signal* corresponds to the sign vehicle of semiotics. This signal . . . is opposed to the sign since it is only its physical embodiment." *Id*.

"From a semiotic point of view, Shannon & Weaver's. . . communications models do not represent signs as one of their elements. Not signs but signals are transmitted in the process of communication. ***Signals are only the energetic or material vehicles of signs, and their physical form. In this sense, a signal is a physical event, while a sign is a mental process***." *Id* at 174.

As explained in herein, the signals ("information") of "information theory"—machine generated differences that humans can perceive by some technological means—are better referred to as DATA outside of engineering.

Thus, IntellAmp technologies are difficult to understand even when the goal is understanding. But the financial industry's goal is to win, so it has confused the issues. This confusion can be remedied by use of this chain: engineer-designed machines create structured DATA,[13] said DATA are structured to generate FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION (e.g., English language words which have concrete meaning to English-readers), and said DATA are further structured to generate SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION (e.g., result of understood and humanly-useful currency trading concepts gleaned from the English words). [14] So, engineers CREATE MACHINES to generate DATA structured to function as first-order English symbols AND generate second-order logical concepts at the same time—IntellAmp technology really is that complicated.

The financial industry has been able to generate even more confusion by the conflation of a real dichotomy between "engineering" information (as in

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[13] Data are machine-generated-tangible-differences, where "tangible" means perceivable by humans via some technology such as voltmeter measurements, pixel brightness differences (LCD monitor), haptic differences (cell phone on vibrate), audio difference (cell phone with audible ringtone), etc.

[14] See Appendix B example where varying brightness pixels (machine states) that form words of Spanish language remain DATA to human who does not understand Spanish, but becomes INFORMATION (meaning, thoughts) when the machine states are transformed e.g. brightnesses varied such brightnesses understood to form words of English language (first-order thought) when viewed by a human who does understand English, such words further understood as conveying a useful and concrete meaning (second-order thought) in a human who further understands currency trading.

Alice's claims, and as data communications engineers use the term) and "ordinary" everyday information (the way normal people use the term). This dichotomy is real, but confusion can be avoided due largely in part to the newer vocabulary invented by Professor Luciano Floridi in his article, "Semantic Conceptions of Information", *The Stanford Encyclopedia of Philosophy* (Spring 2013 Edition), Edward N. Zalta (ed.), URL =<http://plato.stanford.edu/archives/spr2013/entries/information-semantic/>.

A. Adoption Of Professor Luciano Floridi's Newer Formal Vocabulary Recognizing That DATA (Machine-Generated Differences) "Causes" INFORMATION (Concrete Meanings In The Mind Of The Human Perceiving The DATA) Helps See Through The False Cause Of Such Concrete Meanings Arising "From Nothing"

Data communications engineers' use of the term "information" ("engineering-information")—e.g., consistent with Shannon's Mathematical Theory of Communication (MTC)—can be very confusing because it is so different from the way normal people use the term. In engineering-information, psychological/mental states are irrelevant. Engineering-information is not information in the ordinary sense of the word. "Engineering-information" has an entirely technical meaning: information without human meaning, such as would be transmitted over a fiber optic cable or telegraph wire. Floridi, *Semantic*, § 2.2. "The 'goal [of engineering information] is to . . . eliminate the psychological factors involved' . . . subtract human knowledge from the equation" J. Gleick, *Information: A History, A Theory, A Flood* 200-

201 (2011). "Shannon . . . declared meaning to be 'irrelevant to the engineering problem.'" *Id* at 416.

But, in engineering references, the term used is typically just "information"—as such term is used in Alice's claims—even though what is meant is "engineering-information"; information devoid of all human-semantic meaning such as might be transmitted over a telegraph wire. This unfortunate identity of terms for radically different things (engineering-information versus "ordinary" information), can be used, as the financial industry has done here, to argue that IntellAmp claims are drawn to "ordinary" information: human-semantic meaning, or human thought.

Why does this matter? Because in this way it can be argued that IntellAmp patents claim ordinary "information" or "human-semantic meaning" which matches up with "mental steps" which are ". . . abstract ideas" and hence are drawn to unpatentable subject matter. *CLS Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269, 1292 (Fed. Cir. 2013) ("abstract ideas—"mental steps").

This is false. One way to see that it is false is to adopt Professor Floridi's consistent use of "DATA" instead of "engineering-information" and use of "INFORMATION" as "ordinary" information and as such term is commonly used outside of engineering.

The dichotomy is real and is heavily used in IntellAmp technologies. IntellAmp patents claim machines/machine-states/machine-state transitions that generate DATA (humanly-perceivable[15] differences) that is structured to cause INFORMATION (e.g., first-order (symbol meaning) and second-order (concept meaning)) in some pre-defined group of humans (e.g., humans who understand English-language symbols and who further understand currency trading concepts).[16]

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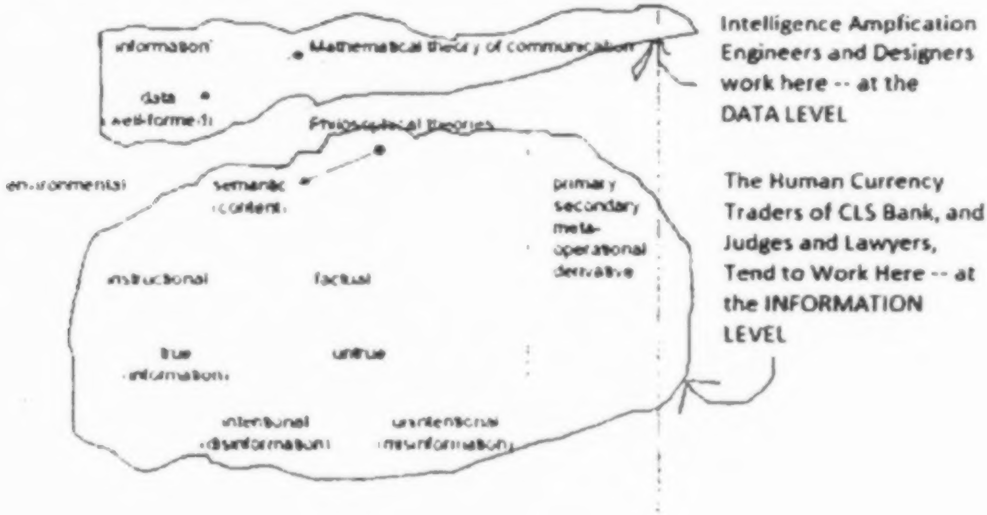
[15] e.g., via technology such as voltmeter measurements, pixel brightness differences (LCD monitor), haptic differences (cell

Floridi has created a map showing the concept of semantic information as "meaningful data":


information
Mathematical theory of communication
data
(well-formed)
Philosophical theories
environmental
semantic
(content)
primary
secondary
meta-
operational
derivative
instructional
factual
true
(information)
untrue
intentional
(disinformation)
unintentional
(misinformation)

Intelligence Amplification Engineers and Designers work here -- at the DATA LEVEL

The Human Currency Traders of CLS Bank, and Judges and Lawyers, Tend to Work Here -- at the INFORMATION LEVEL

The financial industry hopes to confuse the DATA and INFORMATION levels thus leading the Court to conclude Alice claims INFORMATION (abstract ideas), but Amicus—with Professor Floridi's help—

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phone on vibrate), audio differences (cell phone with audible ringtone), etc.

[16] "The moment one transforms that set of signals [machine states] into other signals [human perceptions] our brain can make an understanding of [concrete meaning, or human thought], *then* information is born—it's not in the beeps [machine states]."' Gleick, *Information*, p. 249 "It takes a human—or, let's say, a 'cognitive agent'—to take a signal [data] and turn it into information . . . we *invest* stimuli with meaning, and apart from such investment, they are informationally barren." *Id*. 416-7.

seeks to help the Court keep straight that Alice's claims are drawn to machines (electronic circuits)/ machines-states (e.g., voltages of electronic circuits)/ transitions of machine-states (e.g., transformation of voltage state levels from 0.0-0.8 to 2.0-5.0 measured volts) that create DATA (MACHINE-GENERATED-TANGIBLE-DIFFERENCES), structured to cause INFORMATION in some pre-defined group of humans (e.g., humans who understand English-language symbols and who further understand currency trading concepts).

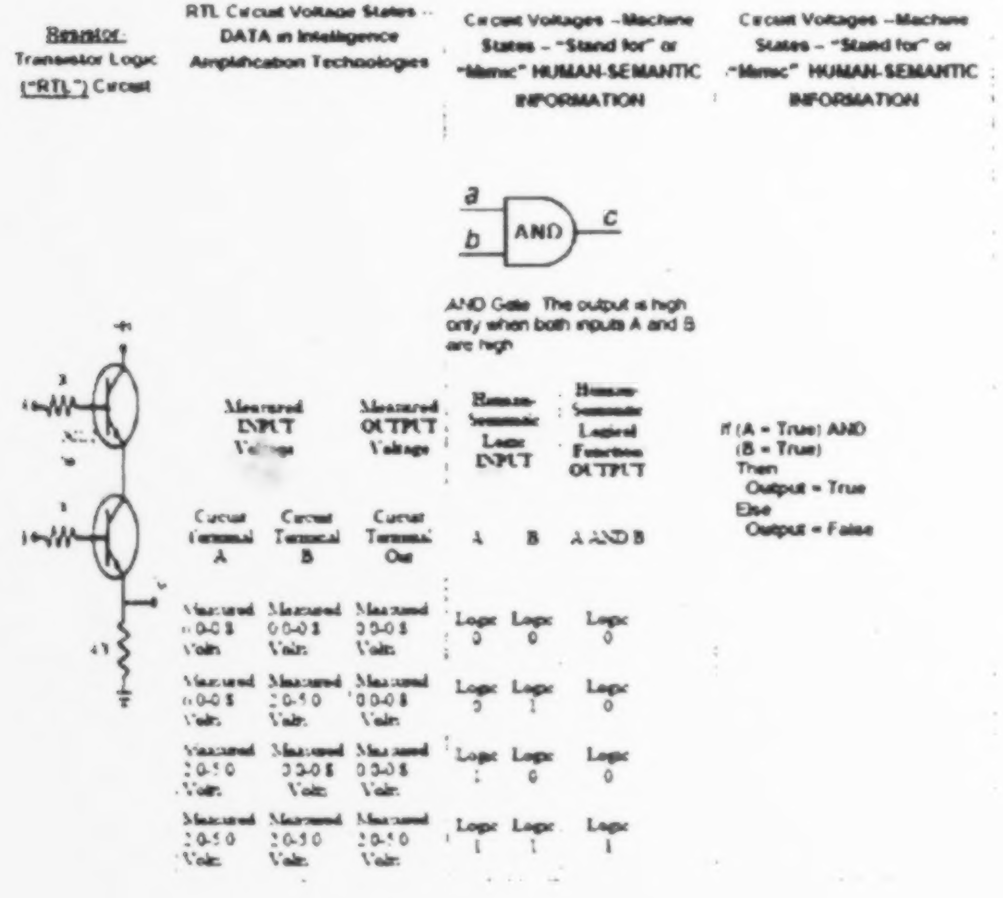
B. IntellAmp Technologies Rely On Engineering Techniques To Activate Human Subjectivity Through Carefully Controlled And Engineered Machine Objectivity

IntellAmp technologies augment/improve the intelligence of humans (such as the human currency traders of CLS bank) via engineering of electronic circuits (machines) to create DATA (plural of DATUM). A datum is a difference that can be perceived by a human via one of the 5 human senses (*e.g.*, sight, hearing, touch, taste, smell). Floridi, *Semantic*, S 1.3; Gleick, *Information* p. 161.

IntellAmp technologies use conventions such that the DATA can "stand for" some defined human-semantic meaning (INFORMATION). For example, the following table shows how ANALOG electronic circuit voltages—DATA—and an accompanying set of conventions allow the ANALOG electronic circuit voltages to "stand in for," or mimic, two-valued (*e.g.*, DIGITAL) human-symbolic logics (*e.g.*, Boolean logics or equivalently natural-language-like "if then" conditional logic statements). ***These techniques are fundamental, and still form the basis of InfoAge***

and IntellAmp technologies, such as Alice's, albeit via increased design complexities by factors that likely number in the trillions:[17]

If patent attorneys return to drafting claims in the lexicon of electrical engineering, LIKE YOU JUST DID, judges and juries will try to skip over engineering-speak. Does the court really want to read



Resistor-Transistor Logic ("RTL") Circuit

RTL Circuit Voltage States -- DATA in Intelligence Amplification Technologies

Circuit Voltages --Machine States – "Stand for" or "Mimic" HUMAN-SEMANTIC INFORMATION

Circuit Voltages --Machine States – "Stand for" or "Mimic" HUMAN-SEMANTIC INFORMATION

AND Gate The output is high only when both inputs A and B are high

Measured INPUT Voltage		Measured OUTPUT Voltage	Human-Semantic Logic INPUT		Human-Semantic Logical Function OUTPUT
Circuit Terminal A	Circuit Terminal B	Circuit Terminal Out	A	B	A AND B
Measured 0.0-0.8 Volts	Measured 0.0-0.8 Volts	Measured 0.0-0.8 Volts	Logic 0	Logic 0	Logic 0
Measured 0.0-0.8 Volts	Measured 2.0-5.0 Volts	Measured 0.0-0.8 Volts	Logic 0	Logic 1	Logic 0
Measured 2.0-5.0 Volts	Measured 0.0-0.8 Volts	Measured 0.0-0.8 Volts	Logic 1	Logic 0	Logic 0
Measured 2.0-5.0 Volts	Measured 2.0-5.0 Volts	Measured 2.0-5.0 Volts	Logic 1	Logic 1	Logic 1

```
If (A = True) AND
  (B = True)
  Then
    Output = True
  Else
    Output = False
```

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[17] *Amicus* synthesized table from the sources of Appendix A, and this **interactive** "Basic Gates" page: http://hyperphysics.phy-astr.gsu.edu/hbase/electronic/gate.html #c1; there are many types of logic gate circuits which can be explored on this page. Basic pattern is to click the symbol of the logic gate, then on the resulting page click the "how do you make one" link.

claims like that (as in times past)? If not, the Court should adopt the CAFCInformationAge Test.

The preceding table shows that the analog electronic circuit—paired with the convention of assigning 0.0-0.8 volts to human-semantic "false" and 2.0-5.0 volts to human-semantic "true"—allow the voltages arising from circuit operation to "stand for" or "mimic" the human-symbolic "digital" "If-Then" conditional logic of computer programming or Boolean Truth Tables. ***Today's hyper-complex microprocessors/ VLSICs are built using this and similar circuits over and over. IntellAmp typically uses higher-level programs that assemble combinations of the microprocessors/VLSIC instructions to mimic yet-higher-level human semantic logic (e.g., currency trading). Thus, if the Court can understand this single example, the Court can understand VLSIC/microprocessor and related IntellAmp technologies***.

IntellAmp patent claims are not to human thinking, but instead to the machines (electrical circuits)/ machine-states (electrical circuit voltages)/ machine-state transformations (transitions of voltage levels) perceivable by a human (DATA), said DATA structured to create a concrete meaning in the mind of a human observer (INFORMATION).

V. CONCLUSION

A. The CAFC's Decision of Alappat Encodes That Either-Or Hardware"-"Software" ("Not Hardware") Dilemma is False, and is Thus a Machine-or-Transformation Test Appropriate to the Information Age

Alappat, 33 F.3d 1526 (Fed. Cir. 1994), recognizes that the hardware-software either-or dilemma is false, and allows pure (non-hybrid) Info Age machine statutory class claims but without the legal dilemmas of the CAFCIndustrialAge Test:

> Alappat admits that claim 15 would read on a general purpose computer [microprocessor] programmed to carry out the claimed invention, but argues that this alone also does not justify holding claim 15 unpatentable as directed to nonstatutory subject matter. We agree. ***We have held that such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software.***

Alappat, 33 F.3d 1526, 1544-1545 (Fed. Cir. 1994).

The Court should thus adopt *Alappat* as a Machine-or-Transformation test appropriate to the Info Age on at least this basis.

B. Applying the DATA-INFORMATION Vocabulary to CAFC Decisions Made in Specific Response to IntellAmp Technologies Produces an IntellAmp Machine and/or Transformation Test Immune to Attorney Argument That Claims Are Drawn To "Abstract Ideas" (INFORMATION) When Such Claims Are Actually Drawn To Machines/Machine-States/Machine-State Transformations That Create DATA (Tangible (Perceivable)[18] Differences) Structured to Cause INFORMATION (Concrete Human Meanings) In The Mind Of A Human Reader [19]

The CAFC decided two of the seminal CAFCInformationAge Test cases in direct response to IntellAmp technology complexity: *AT&T v. Excel*, 172 F.3d 1352 (Fed. Cir. 1999)—holding pure (non-hybrid) statutory-process-class claims to IntellAmp patentable subject matter under 35 USC § 101; and *State Street Bank*, 149 F.3d 1368 (Fed. Cir. 1998)—holding pure (non-hybrid) statutory-machine-class claims to IntellAmp patentable subject matter under 35 USC § 101.

The CAFCInformationAge Test avoids confusion by letting judges work in terms of the humanly useful end result (INFORMATION, or human meaning), secure that if such result is from computer/communications engineering, what is actually being claimed are machines (electrical circuits)/machine-states (voltages)/transformations of voltages (transitions of voltages) that produce DATA (tangible differences) which a human would interpret as the INFORMATION (concrete meaning) found useful.

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[18] While not always visible to the naked eye, machine state changes are humanly-perceivable even on small chips through the use of various technologies.

[19] See Appendix B example where varying brightness pixels (machine states) that form letters of Spanish language remains DATA to human who does not understand Spanish, but becomes INFORMATION (meaning, thoughts) when recast as English and viewed by a human who understands English.

Using the DATA-INFORMATION vocabulary, *AT&T v. Excel* may be read as holding that if a pure-process-statutory-class IntellAmp claim is drawn to a useful and concrete result (INFORMATION), such is statutory subject matter if the patent discloses the use of machine-generated process DATA (e.g., humanly-perceivable (tangible) machine-states (electrical circuit voltages)/machine-state transitions (transformations of electrical circuit voltages)) structured to cause the useful and concrete results (INFORMATION) in the mind of a human:[20]

> As previously explained, ***AT&T's claimed process employs subscribers' and call recipients' PICs as data***, applies Boolean algebra ***to those data to determine the value of the PIC indicator***, and applies that value through switching and recording mechanisms ***to create a signal useful for billing purposes***. . .
>
> . . .
>
> . . . understanding of ***transformation*** is consistent with our earlier decision in

---

[20] See Appendix C example of red-black dominos machine-state transitions/transformations causing Tangible (humanly perceivable) result, which causes Concrete meaning (human thought or meaning to one who understands English) which humans find Useful.

> Arrhythmia, . . . Arrhythmia's process claims included various mathematical formulae to analyze electro-cardiograph signals to determine a specified heart activity. . . .. The Arrhythmia court reasoned that the method claims qualified as statutory subject matter by ***noting that the steps transformed physical, electrical signals from one form into another form***— a number ***representing a signal related to the patient's heart activity***, a non-abstract output. . . . The finding that the ***claimed process "transformed" data [perceivable voltages, or machine-states] from one "form" to another*** simply confirmed that Arrhythmia's method claims ***satisfied § 101*** because the mathematical algorithm included within the process was applied to produce a number which had had **specific meaning**—a **useful, concrete [meaning]**, [arising from] tangible [(perceivable) machine-generated differences].

AT&T v. Excel, 172 F.3d 1352, 1358-1359 (Fed. Cir. 1999).

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *AT&T* as part of a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies that holds that if a pure-process-statutory-class claim's plain English is drawn to a useful and concrete result (e.g., causes meaning, "who owes what regarding phone bills" in the mind of the judge—INFORMATION), such is statutory subject matter if the patent discloses humanly-perceivable (tangible) machine-states (electrical circuit voltages)/ machine-state transitions (transformations of electrical circuit voltages) that cause DATA (e.g., "logged history" of machine-state (voltage) transitions/ transformations, or process) that can be interpreted as INFORMATION in the mind of the judge.

Using DATA-INFORMATION vocabulary, *State Street* may be read as holding that if a pure-machine-statutory-class IntellAmp claim is drawn to a useful and concrete result (INFORMATION), such is statutory subject matter if the patent discloses the use of machine-generated DATA (e.g., humanly-perceivable machine-states (electrical circuit voltages) /machine-state transitions (transformations of electrical circuit voltages)) to cause the useful and concrete result (INFORMATION) in the mind of a human:

> Today, we hold that the ***transformation of data [machine-generated differences engineered such that human would understand them as] representing discrete dollar amounts, by a machine through a series of [machine-states that "stand in for" or "mimic"] mathematical calculations*** . . . constitutes . . . [patentable subject matter] ***because it produces [humanly perceivable, or tangible, machine-states that "stand in for" or "mimic"] "U"—a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades*** [—concrete human-semantic meaning, INFORMATION, such information economically useful to the human].

State Street, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *State Street Bank* as part of a machine-or-transformation test appropriate to the InfoAge and IntellAmp technologies that holds that if a pure-machine-statutory-class claim's plain English is drawn to a useful and concrete result (e.g., causes meaning "share price" in the mind of the judge—INFORMATION), such is statutory subject matter if the patent discloses humanly perceivable (tangible) machines (electrical circuitries)/machine-states (electrical circuit voltages)/machine-state transformations (transitions of electrical circuit voltages) that are engineered to create DATA that can be interpreted as INFORMATION in the mind of the judge.

As shown, the Court—through use of DATA-INFORMATION vocabulary—could thus adapt *AT&T* and *State Street* to be a Machine and/or Transformation test appropriate to the InfoAge, and in particular to IntellAmp Technologies.

C. *Allapat, AT&T v. Excel*, and *State Street Bank* Form An IntellAmp Technologies Machine-or-Transformation Test that Improves Public Notice in View of the Technical Expertise of the Patent and Trademark Office ("PTO") and Improves Judicial Efficiency of Post-Issuance Interpretation Consistent with *Markman* Jurisprudence

The CAFCInformationAge Test allows attorneys to claim electronic circuits (machines)/ electronic circuit voltages (machine states)/ electronic voltage transitions (transformations of machine states) via natural English language particularly well suited to the practical two-stage approach that the United States Government ("Government") takes to patent claims.

In the first stage (pre-patent claim issuance), the Government requires that the PTO ensure that the technical subject matter undergirding the attorney's claims to legal monopoly be new (*e.g.*, 35 U.S.C. § 102) and that what is new is non-trivial (*e.g.*, 35 U.S.C. § 103). If the patent attorney is able to establish that the technical subject matter of her client's patent claims is new and non-trivial, the patent issues.

In the second stage (post-patent claim issuance), under Markman jurisprudence, a member of the Federal Judiciary finally gives interpretation to that in which the attorney's client is most intensely interested: the claim to exclude others (35 U.S.C. § 154) via patent infringement lawsuits (35 U.S.C. § 271(a), (b), and (c)) from commercial use of the client-owned technologies (e.g., technologies which a person who works in the technical field would find implicated by the words of the claim) via interpretation of the contours of the legal monopoly claimed. Thus, the United-States system conserves judicial resources by barring from issuance, and thus judicial interpretation, claims to legal monopolization of technical subject matter that is not really new.

The CAFCInformationAge Test allows a patent attorney to draft claims to IntellAmp technologies—circuits (machines)/circuit voltages (machine-states)/voltage transitions (machine-state transformations)—in the form of natural English language. The attorney—through her technical training as verified by registration with the PTO—knows that IntellAmp technologists often describe their electronic circuits/processes in very-constrained sub-sets of natural English language (e.g., conditional "if then" natural-language-like computer-programming statements such as briefly discussed herein in the context of the circuits that "stand for" the human-semantic Boolean AND function) and thus expects that a patent examiner will interpret the natural English language as "standing in" for the requisite new IntellAmp technical subject matter.

The CAFCInformationAge Test strengthens the statutory notice function of the patent claims by allowing the attorney—through her legal training, experience, licensure by her respective state bar admissions, and in particular her close attention to the courts' patent jurisprudence—to draft her claims to legal monopoly in the form of natural English language instead of the specialized vocabulary of computer programs as they actually are (e.g., sequences of voltage levels), microprocessors/VLSICs, transistors, capacitors, circuits standing for logic gates, ASICS, etc. which the natural English represents.

That is, the CAFCInformationAge Test allows the attorney to draft a natural English language claim to legal monopoly such that a Federal Judge—and the public—can construe the overall contours of the claims to legal monopoly in view of the patent statutes and extant relevant judge-made law (*e.g*., via rules very analogous to those which the judge routinely uses to legally construe legal statutes and/or legal contract language) but without first wading into the mind-bending minutiae of the electronics.

But that clarity comes in exchange for an expected quid pro quo: the attorney expects that once the Federal Judge has finished construing the overall contours of the claims to legal monopoly, the Federal Judge will interview those who routinely work in the technical field to determine what technologies—e.g., the machines/machine-states/machine-state transformations of IntellAmp technologies—the natural English language of the claims really "stand in" for, and thereafter substitute the understood technical meaning for the natural language. Effectively, the drafting attorney expects that the judge will back into that technical subject matter about which the patent examiner was concerned during patent examination.[21]

If this most important step of "backing into" the technical subject matter really encompassed by the claim is skipped, and especially in IntellAmp technologies such as Alice's, claim construction stops and confusion arises from the free-floating natural English language of the claims leading one to the erroneous conclusion that they are related to "abstract ideas"—*e.g.*, free-floating human mental constructs for which no one can get paid.

However, if this most important second step is done, the Question Presented becomes tautological: When properly construed, Alice directly claims electronic circuits (machines), mapped states of the electronic circuits (processes), and media bearing signals which will generate electrical voltages (such media being articles of manufacture) which by definition are statutory subject matters. This is why applying the CAFCIndustrialAge Test to such claims as a test for patentability results in an apparent legal dilemma[22]—

---

[21] Like contract construction, except that once the judge has construed the overall legal contours, she determines the meanings of disputed terms of patent claims more like statutory construction—based on what disputed terms would have objectively meant to one of skill in the technologies. *Markman v. Westview Instruments*, 52 F.3d 967, 987 (Fed. Cir. 1995).

[22] See *Amicus* D. Cook Br. p. 32 ("DILEMMA: For processes-emergent-from-program assembled- machines-in-operation-OR-program-assembled- machines-proper, the CAFCIndustrialAge

the claims are already drafted to machines (*e.g.*, massive configurations of special purpose electrical circuits) and transformations (*e.g.*, processes describing the humanly-perceivable transformations of voltage level inputs to voltage level outputs). Since the claims ALREADY encompass machines and transformations, requiring that the claims encompass additional machines and transformations beyond those which they already claim directly gives rise to much confusion.

Alappat, 33 F.3d 1526, 1544 (Fed. Cir. 1994), can be read as part of a machine-or-transformation test appropriate to the InfoAge and IntellAmp technologies that recognizes that the hardware-software dichotomy is false, and allows pure (non-hybrid) machine statutory class claims to InfoAge technologies without the legal dilemmas of the hybrid claims required by the CAFCIndustrialAge Test.

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *AT&T v. Excel*, 172 F.3d 1352 (Fed. Cir. 1999) as part of a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies that allows pure-process-statutory-class claims to InfoAge and IntellAmp technologies without the legal dilemmas of the hybrid claims required by the CAFCIndustrialAge Test.

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *State Street Bank*, 149 F.3d 1368 (Fed. Cir.

Test seems to require that an attorney achieve patentable subject matter at the expense of claims subject to strong (and thus expensive) attorney argument that such claims are invalid "as a matter of law" (*IPXL v. Amazon*) OR unenforceable "as a matter of law" (*NTP v. RIM*). Or vice versa.")

1998), as part of a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies that allows pure-machine-statutory-class claims to InfoAge and IntellAmp technologies without the legal dilemmas of the hybrid claims required by the CAFCIndustrialAge Test.

For at least these reasons, the Court should adopt *In Re Alappat, AT&T v. Excel, and State Street Bank*—but clarified via the newer formal DATA-INFORMATION vocabulary as demonstrated herein—as a Machine-or-Transformation Test appropriate to InfoAge, and, in particular, IntellAmp technologies.

Thus, the Court should either

(a) adopt *In Re Alappat, AT&T v. Excel,* and *State Street Bank*—but clarified via the newer formal DATA-INFORMATION vocabulary as demonstrated herein—as a Machine-or-Transformation Test appropriate to InfoAge, and, in particular, IntellAmp Technologies, OR

(b) require Markman-compliant claim construction in all patent litigations, for at least reasons argued in *Amicus* D. Cook Br. 1-33.

Respectfully submitted,

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January 23, 2014

APPENDIX

APPENDIX A

Bibliography Including Works Cited or *Works Consulted*

All technical descriptions herein are a synthesis of Amicus based a combination of his working knowledge, consultation with various technical experts, and at least these following works. *As an aid to the Clerks, Amicus has stack ordered the works in case they care to read any of them*:

Floridi, Luciano, "Semantic Conceptions of Information", The Stanford Encyclopedia of Philosophy (Spring 2013 Edition), Edward N. Zalta (ed.), URL = http://plato.stanford.edu/archives/spr2013/entries/information-semantic/; *See* especially Figure 1 ("for data versus information");

See Wikipedia, Intelligence Amplication, http://en.wikipedia.org/wiki/intelligence_amplification (as of Jan. 23, 2014 9:20 GMT)

Blum, J., *Exploring Arduino: Tools and Techniques for Engineering Wizardry* (2013)

Gleick J., "The Information: A History, a Theory, a Flood" (Publication date: 3/1/2011; ISBN-13: 9780375423727; Publisher: Knopf Doubleday Publishing Group);

See Wikipedia, Logic Gate, http://en.wikipedia.org/wiki/Logic_gate (please also activate the links in this articl) (as of Jan.13, 2014, 04:3 GMT)

See Wikipedia, *VHDL*, http://en.wikipedia.org/wiki/VHDL ("VHDL was originally developed at the behest of the U.S Department of Defense in order to document the behavior of the ASICs that supplier companies were including in equipment. The idea of being able to simulate the ASICs from the information in this documentation was so obviously attractive that logic simulators were developed that could read the VHDL files. The next step was the development of logic synthesis tools that read the VHDL, and output a definition of the physical implementation of the circuit.")

See Wikipedia, Integrated Circuit, http://en.wikipedia.org/wiki/Integrated_circuithttp://en.wikipedia.org/wiki/ Integrated_ circuit

See Wikipedia, Application-Specific Integrated Circuit http://en.wikipedia.org/ wiki/ASIC ("An application-specific integrated circuit (ASIC) /eɪsɪk/, is an integrated circuit (IC) customized for a particular use, rather than intended for general-purpose use.")

See Wikipedia, C to HDL, http://en.wikipedia.org/wiki/C_to_HDL

See Wikipedia, *Hardware Description Language*, http://en.wikipedia.org/wiki/Hardware_description_language#History

See Wikipedia, High-Level Synthesis, http://en.wikipedia.org/wiki/High-level_synthesis("High-level synthesis (HLS), sometimes referred to as C synthesis, electronic system-level (ESL) synthesis, algorithmic synthesis, or behavioral synthesis, is an automated design process that interprets an algorithmic description of a desired behavior and creates digital hardware that implements that behavior")

See Wikipedia, Instruction Set Architecture, http://en.wikipedia.org/wiki/Instruction_set_architecture ("Instruction set architecture is distinguished from the micro-architecture, which is the set of processor design techniques used to implement the instruction set. Computers with different microarchitectures can share a common instruction set. For example, the Intel Pentium and the AMD Athlon implement nearly identical versions of the x86 instruction set, but have radically different internal designs.")

See Wikipedia, Microarchitecture, http://en. wikipedia.org/wiki/Microarchitecture (In computer engineering, micro-architecture (sometimes abbreviated to µarch or uarch), also called computer organization, is the way a given instruction set architecture (ISA) is implemented on a processor.)

See Wikipedia, Claude Shannon, http://en.wikipedia.org/wiki/Claude_Shannon (Invented circuits and associated conventions that "stand for" human-semantic two-valued if-then or Boolean logics).

See Wikipedia, Logic Synthesis http://en.wikipedia.org/wiki/Logic_synthesis

See Wikipedia, Boolean Algebra http://en.wikipedia.org/wiki/Boolean_algebra_(logic) (Including Claude Shannon's invention of circuits that "stand in" for two-element Boolean Algebra which are used today; "Propositional logic is a logical system that is intimately connected to Boolean algebra.[3] Many syntactic concepts of Boolean algebra carry over to propositional logic with only minor changes in notation and terminology, while the semantics of propositional logic are defined via Boolean algebras in a way that the tautologies (theorems) of propositional logic correspond to equational theorems of Boolean algebra.").

See Wikipedia, Propositional Logic which Redirects to Propositional Calculus, ("In mathematical logic, a propositional calculus or logic (also called sentential calculus or sentential logic) is a formal system in which formulas of a formal language may be interpreted to represent propositions.")

See Wikipedia, Microprocessor, http://en.wikipedia.org/wiki/Microprocessor;

See Wikipedia, Electronic System-Level Design And Verification, http://en.wikipedia.org/wiki/Electronic_system-level

See Wikipedia, Electronic Design Automation, http://en.wikipedia.org/wiki/Electronic_design_automation

See Wikipedia, Resistor–Transistor Logic, http://en.wikipedia.org/wiki/Resistor-transistor_logic (describing aspects of Resistor–Transistor Logic) (as of Jan.13, 2014, 04:3 GMT).

See Wikipedia, Register-Transfer Level, http://en.wikipedia.org/wiki/Register-transfer_level

Jeremy Campbell, "Grammatical Man: Information, Entropy, Language, and Life" (a monumental achievement, this first opus has a few inaccuracies that Mr. Gleick cured, but it took great courage for Mr. Campbell to write this, and I am very grateful to Mr .Campbell for his Courage; here is an excerpt from Wikipedia entry: . . . is a 1982 book written by the Evening Standard's Washington correspondent, Jeremy Campbell) http://en.wikipedia.org/wiki/Grammatical_man;

See Wikipedia, The Information: A History, a Theory, a Flood, http://en.wikipedia.org/wiki/The_Information:_A_History,_a_Theory,_a_Flood

See Wikipedia, Field-Programmable Gate Array, http://en.wikipedia.org/wiki/Field-programmable_gate_array

APPENDIX B

THE SUPREME COURT OF THE UNITED STATES

[Filed October 4, 2013]

No. 13-298

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,
Respondents.

On Petition for a Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit

BRIEF OF *AMICUS CURIAE* DALE R. COOK, *PRO SE*, IN SUPPORT OF PETITIONER

Example: IntellAmp Machine-States Must Be Engineered to Create Structured DATA (e.g., Machine-States, such as voltages/ pixel brightnesses) Appropriate to Both Language (English), and Concepts (Currency Trading) of Expected User of the IntellAmp Automation

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* * * *

If viewed from "inside" the machine (e.g., on the inside of an LCD monitor—the part a human can't see), the changes of states of the machine are just that: changes in state (e.g., changes in voltage signals that drive associated brightnesses of pixels on a computer screen). However, when the changes in machine states create a difference a human can perceive, formally "data" (plural of datum) are produced (e.g., the different voltages are such that a human can perceive differences in brightness in at least two areas of the screen). For example, if the changing voltages drove pixel brightness differences creating a character string that an observing human could discern—such as "comprar el dólar canadiense inmediatamente por 90 centavos de dólar en la que tenemos un comprador dispuesto a pagar inmediatamente 95 centavos de dólar"—such a string would constitute data. If a human observer only understands English and not Spanish, such a string would merely constitute data.

However, if data—human-discernible differences (e.g., text string)—are understood to have a meaning by an observing human, such data are said to formally constitute "information." For example, if the data (machines states (e.g., varying voltages/varying pixel brightnesses)) formed the character string "buy the Canadian dollar immediately for 90 cents US in that we have a buyer willing to immediately pay 95 cents US" the data—character string—would constitute information for an English reader.

That character string (data) can be understood by/with human thought, but the data itself does not constitute human thought. From the machine standpoint, it is just the current state of a process that changes pixel brightnesses as dictated by the computer program.

A patent claim to that process would read like the string ("buy the Canadian dollar immediately . . .), but with a proper claim construction, one skilled in the art would understand that what was claimed was the machine-in-motion—process—or an end state of a process that resulted in pixel brightnesses that a viewing human could perceive as the string "buy the Canadian dollar immediately . . . " One skilled in the art would not construe the claim as human thinking because Intelligence Amplification automation, like Alice's, is sold to augment humans, not replace them. Humans are the market to whom Alice sells. Alice does not sell human thinking, but rather a change in machine states/processes, and thus one skilled in the art could never derive human thinking from the claims. That is why this Court's Markman jurisprudence is so critical here.

APPENDIX C

THE SUPREME COURT OF THE UNITED STATES

[Filed October 4, 2013]

No. 13-298

ALICE CORPORATION PTY. LTD.,
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v.
CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,
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On Petition for a Writ of Certiorari to the
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BRIEF OF *AMICUS CURIAE* DALE R. COOK, *PRO SE*, IN SUPPORT OF PETITIONER

Example of Red-Black Dominos Machine-State Transitions/Transformations Causing Tangible (humanly perceivable) Differences, Which Causes Concrete Meaning (human thought or meaning to one who understands English) Which Humans Find Useful

* * * *

Now Amicus presents the emergent process domino analogy in pictures. A computer program for a general purpose processor specifies:

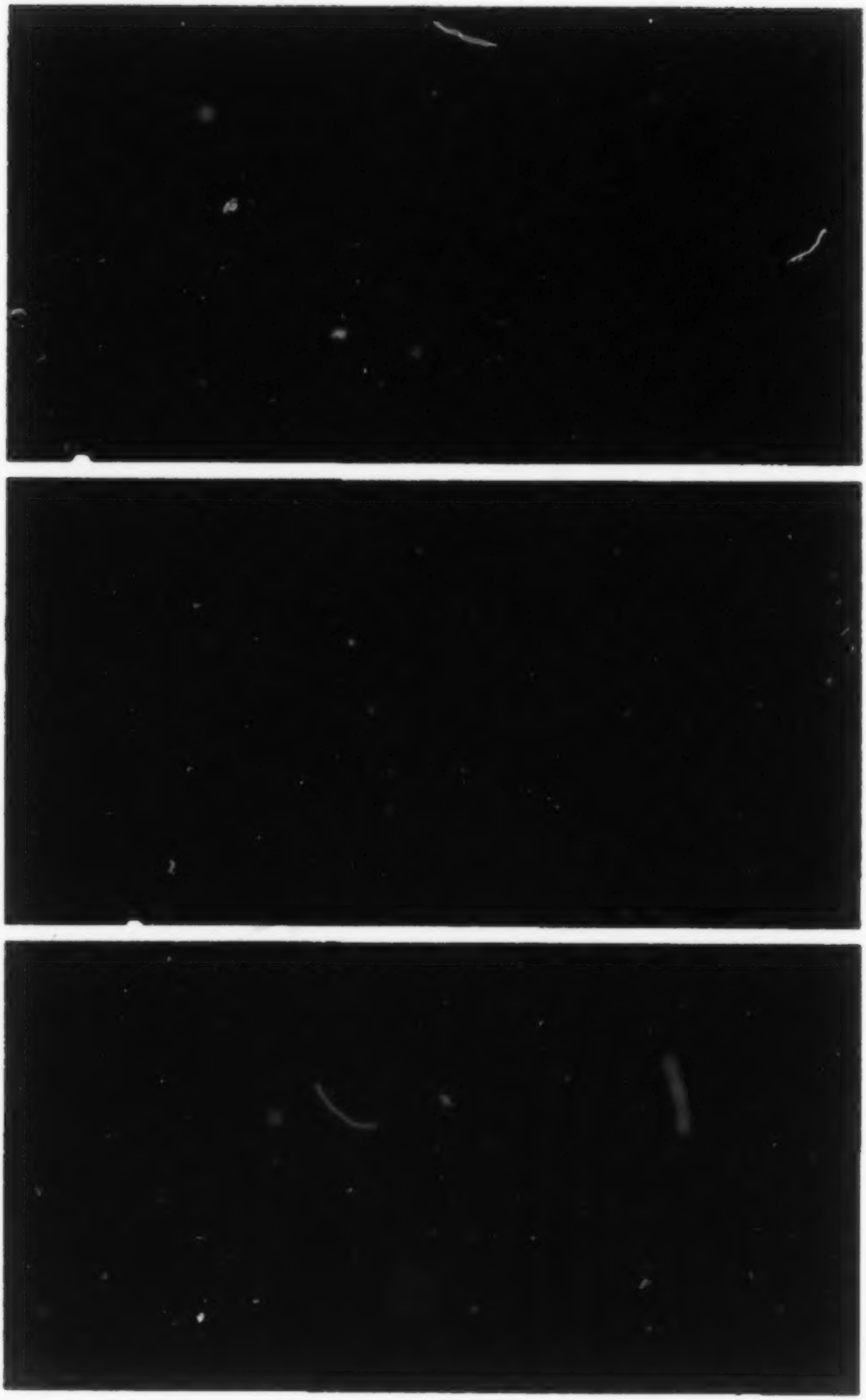
(a) a selection drawn from a collection of many available computing elements in the general purpose processor, analogous to . . . ;

(b) a specification of how the selected computing elements are to be (i) organized (e.g., in sequence or in parallel) to "set up" desired combinational, sequential, and/or parallel logic circuit(s), analogous to ... and (ii) such organization further including the sequences and timing of the voltage levels that will be applied to the various selected computing elements in the "set up" circuit(s), analogous to ...;

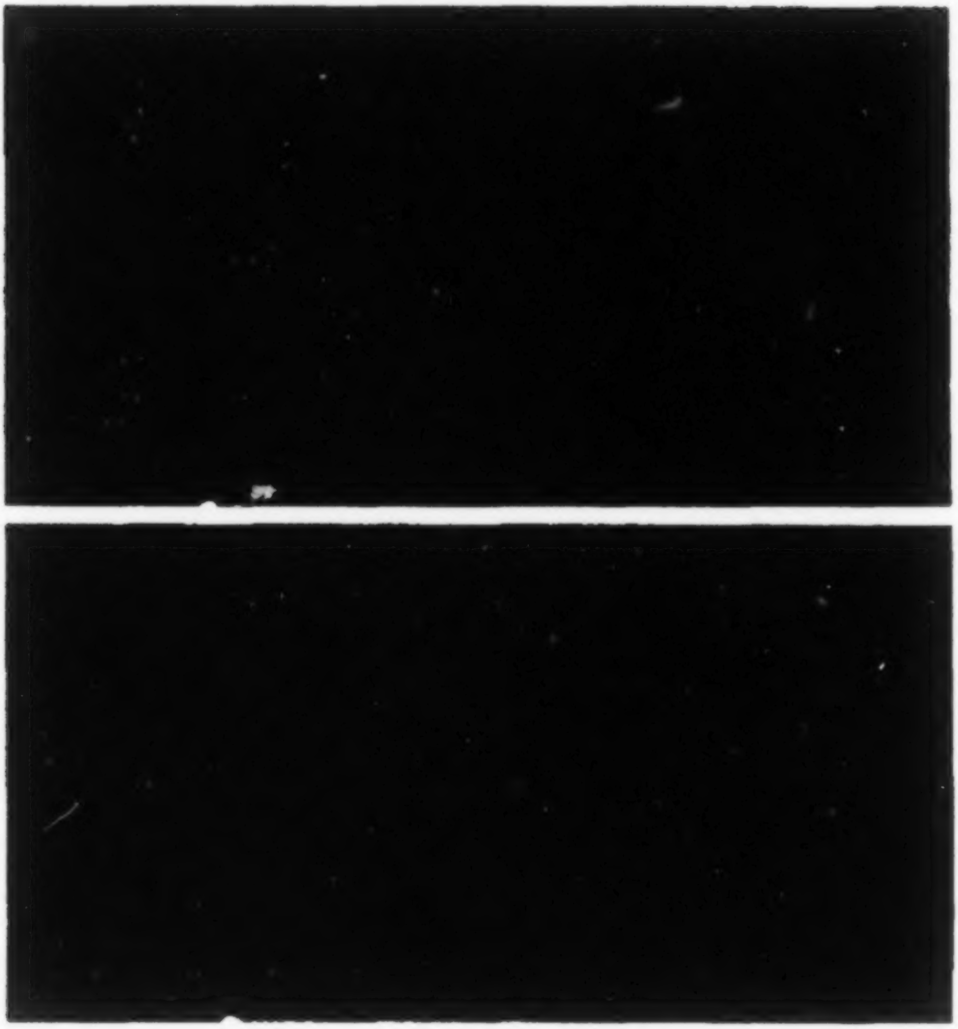
[redacted]

[redacted]

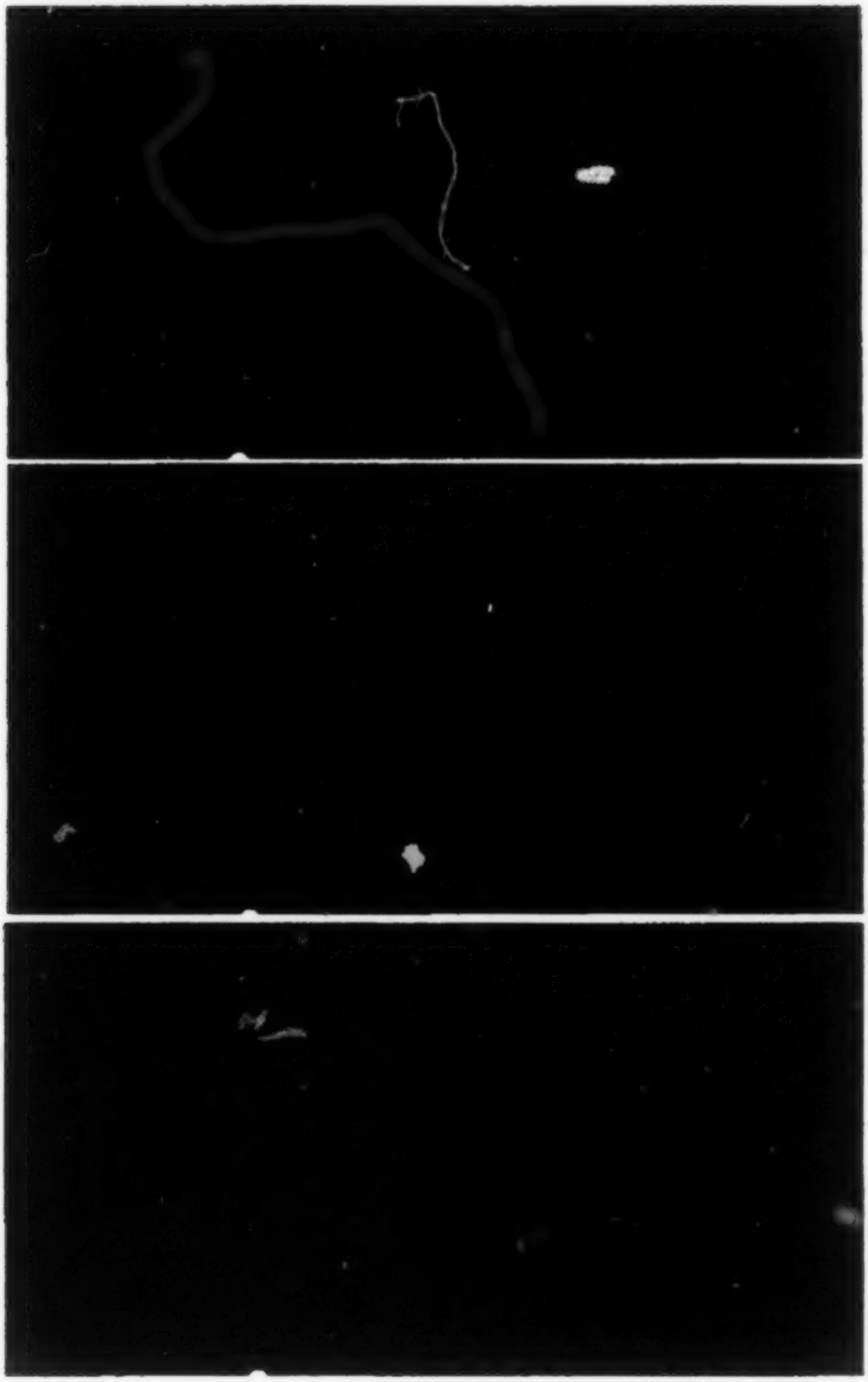
12a



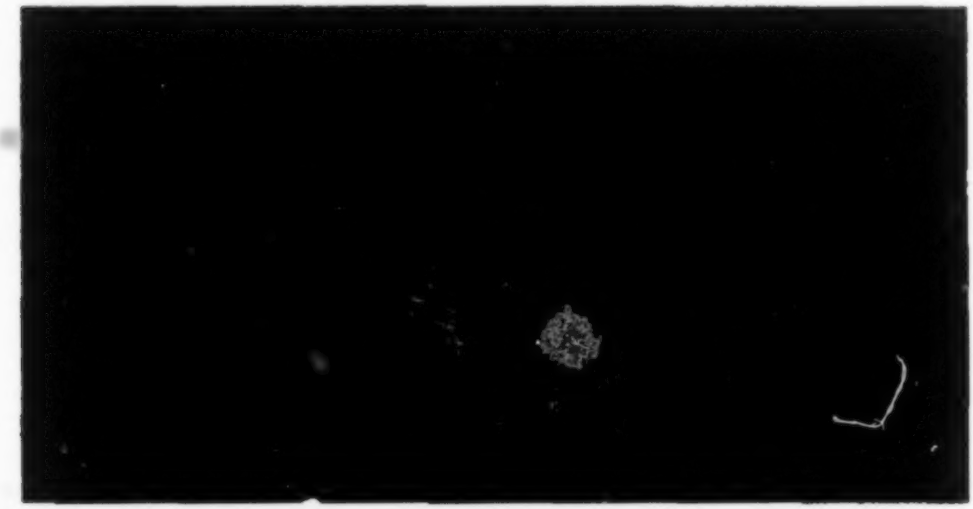
13a



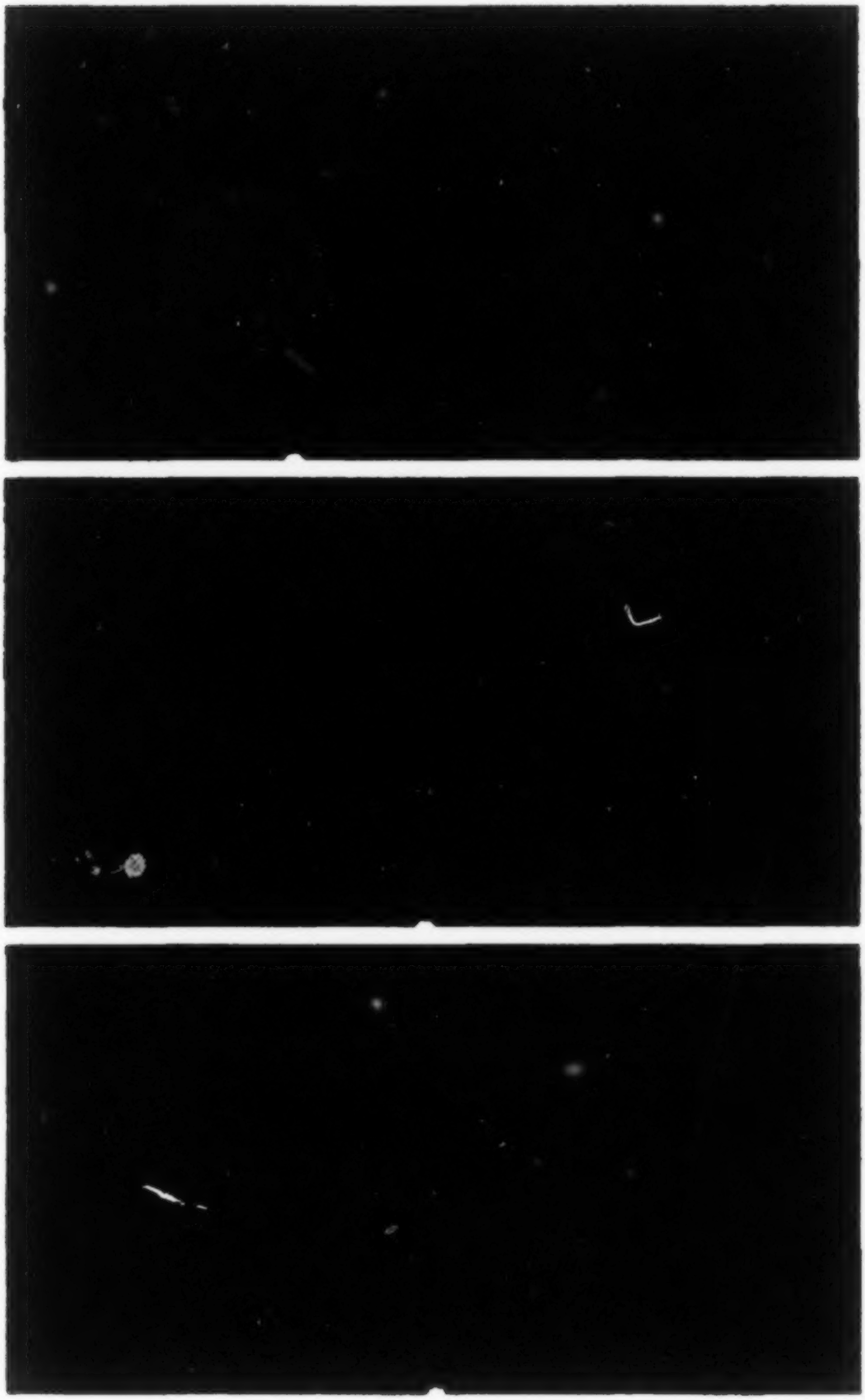
(c) an initiation signal that kicks the logic circuit(s) into action, analogous to ...;



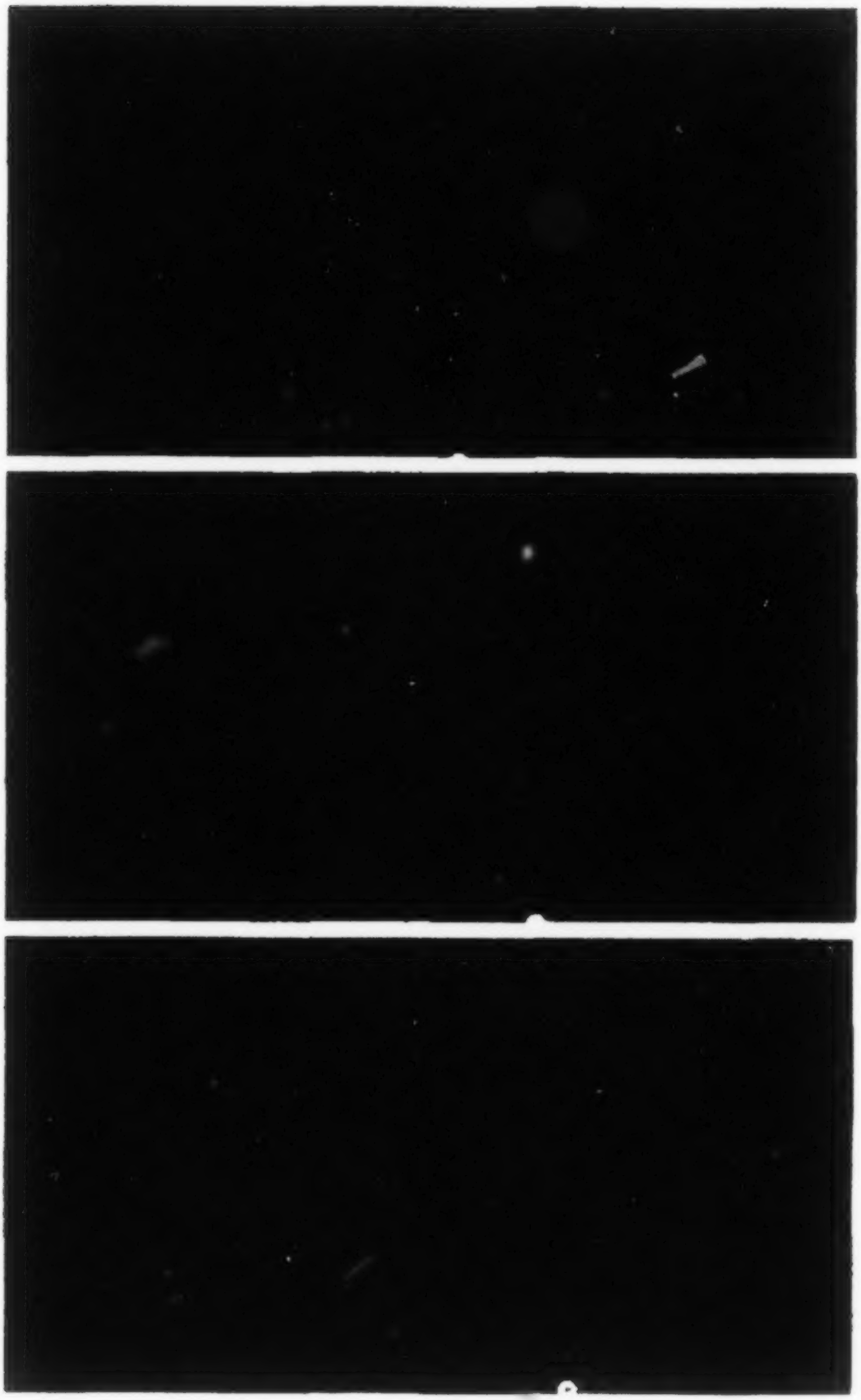
such that (d) after initiation, the states of the various program-selected, program-arranged, and program-timed computing elements as they interoperate in the manner specified by the computer program may be observed/recorded/mapped analogous to ...;



16a



17a



until, (e) ultimately, the flowing pattern/process generated by the interoperating computing circuits gives the result of a set of determined and discrete machine states which manifest a pattern that both (i) can be perceived by and (ii) confers meaning to an observing human, which is analogous to ...:

This mechanical contrivance is analogous to electronic processes-emergent-with-program-assembled-machines-in-operation, but constitutes mechanical processes-emergent-with-program-assembled-machines-in-operation in its own right. But it is not new. There is no need to augur this, as in the judge-created exceptions to otherwise patentable subject matter. Lack of novelty can be objectively demonstrated for the domino message transmission machine and process. Amici urge the Court to vitiate the inscrutable judge-created exceptions to otherwise patentable subject matter in view of criteria that can be demonstrated via objective evidence.

The precision and control of the domino process/pattern that dynamically flowed and was called into being as the dominoes fell into each are anything but

abstract, and result in intermediate/ending states of discrete red-black (binary) dominoes.

The result is a red-black pattern recognized by the viewer as the letter "V" for Specific, an Antonym of Abstract. Amici note that the red-black dominos constitute:

(a) Tangible Perceptions (humanly perceivable differences—formally "data"): something is tangible if it can produce data (plural of datum). Data are one or more differences that can be registered by one or more of the human physical senses (sight, hearing, touch, smell, etc.); the process/result of the process is tangible because it produces a pattern of red-black differences that are perceivable by human vision;

(b) Concrete Meaning (humanly understandable data—formally "information"): information is a difference (data) that makes a difference to someone. Here, the result of the process has concrete meaning in that an English reader can discern the human-semantic letter "V" from the red-black pattern, via a priori known letters of the English alphabet; and

(c) Useful Information (humanly valuable information): the result is valuable in that it allows the Court to understand that Alice's technologies are not anything like what a human does with pen and paper, and are not the human mind itself. The result allows the Court to understand just how far afield the courts have been led in that it provides an analogy demonstrating claimed computational processes are the polar opposite of abstract.

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No. 13-298

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On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF *AMICUS CURIAE* DALE R. COOK, *PRO SE*, IN SUPPORT OF PETITIONER

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QUESTION PRESENTED

Whether claims to computer-implemented inventions-including claims to systems and machines, processes, and items of manufacture-are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

PARTIES TO THE PROCEEDING

All parties to the proceeding are identified in the caption.

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INTEREST OF *AMICUS CURIAE* [1]

Dale Cook, *Pro Se Amicus*, the real party in interest, an attorney licensed by Texas (1992) and Washington (2001), filed an *Amicus* brief in the court below, and at the Petition Stage.

SUMMARY OF ARGUMENT[2]

In times past, electrical-engineer patent attorneys patent-claimed Information Age ("InfoAge"), and in particular Intelligence Amplification ("IntellAmp"), technologies like Alice's but they did so in terms of the actual electronic circuits (*e.g.*, Resistor-Transistor Logic circuits) which were assembled, activated, and operated via a large number of sequences of voltages that were sequentially impressed in parallel to the pins of a type of Integrated Circuit ("IC") (*e.g.*, a "general purpose processor"). The practice was that the electrical engineer would receive the large number of sequences of voltages to be impressed upon the processor in the form of a medium such as magnetic oxide (*e.g.*, computer tape drive or hard disk drive)—a stored computer program. In view of the state of the law, the electrical engineer patent attorney, on behalf of his client (*e.g.*, the Integrated Circuit Banking Machine Corporation ("ICBM")) would then work with engineers/programmers to determine/synthesize the circuits created/likely created by the computer program as its voltages were applied to the pins of the IC (processor) to find those electronic circuits in the sequence of assembled circuits that represented the most commercially valuable results arising from the computer program.

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[1] No counsel for a party authored this brief in whole or in part, and no party or counsel for a party made a monetary contribution intended to fund the preparation or submission of this brief. No one other than *amicus curiae*, its members, or its counsel made a monetary contribution to the preparation or submission of this brief. Parties have consented to *Amicus* briefs.

[2] *Amicus* notes that Sections I-III below (technology-centric) and Section (IV (legal centric) may be read in either order depending upon preferences.

The electrical-engineer patent attorney would then claim variants of those activated electronic circuits. These claims were insanely hard to parse, and in no way abstract, and they met all legal requirements. And they were valuable to the attorney's client.

But . . . it was very labor intensive for a person reading such claims to know what they covered in the real commercial world if they did not already know, at the front end, what human-semantic logic the circuits worked to mimic. Not a great system for judges and the public, but great for the people who knew the legally required "encryption algorithm," provided by the electrical engineer in the employ of the client. That is, the attorney's client (ICBM) knew what commercial activity was being infringed, but it was a high intensity exercise (but doable) for anyone else to know exactly what commercial activity was being infringed by legal instruments drafted in the working vocabulary of electrical engineers. And this had the added benefit of making electrical-engineering patent attorneys immune from legal malpractice lawsuits—a special type of lawyer, "above the law"—because no one could understand the claims well enough to claim attorney error should something go wrong in assertion.

Then . . . the Court of Appeals for the Federal Circuit (CAFC) changed everything, creating a "CAFCInformationAge Test"—defined by three seminal cases: *In re Alappat*, 33 F.3d 1526 (Fed. Cir.

1994), *AT&T Corp. v. Excel Communs.*, 172 F.3d 1352 (Fed. Cir. 1999), and *State Street Bank & Trust Co. v. Signature Fin. Group*, 149 F.3d 1368, 1373 (Fed. Cir. 1998)—that allowed the complex electrical engineering subject matter to be claimed in natural English language that described the commercially valuable results arising from the complex electrical engineering subject matter. In tandem with that law, and as shown herein, the CAFC also created its Markman Jurisprudence, *Markman v. Westview Instruments*, 52 F.3d 987 (Fed. Cir. 1995), which this Court validated in *Markman v. Westview Instruments,* 517 U.S. 370 (1996), which when paired with the CAFCInformationAge Test allowed a reviewing Federal Judge to construe the broad legal contours of the claim in terms of its commercially valuable end results (Markman Phase 1—construing the legal instrument) prior to actually engaging the incomprehensibly-complicated electronic-engineering technologies of the Information Age (Markman Phase 2—consulting electronic engineers/programmers as to what machines-processes, articles-of-manufacture were meant by the natural English language of the patent claims). With respect to Information Age technologies, this allowed the reviewing Federal Judge to handle the major legal issues first, but without ever having to wade into the mind-warping electronic engineering technologies, which he ordinarily would have had to do before the CAFCInformationAge Test.

For example, due to the fact that the CAFCInformationAge Test allows claiming of the commercially valuable results in plain English—rather than volts, amps, resistance, timing diagrams, transistors, capacitors, etc.—a judge can determine in a first stage whether the defendant is not liable—

under either direct (35 USC 271(a)) or vicarious (35 USC 271(b)-(c)) infringement theories—on the law alone. For example, because (a) as a matter of law no single legal entity can practice the claim as drafted, *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318 (Fed. Cir. 2008)[3] , (b) as a matter of law the claim as drafted is invalid as indefinite, *IPXL Holdings v. Amazon.com*, 430 F.3d 1377 (Fed. Cir. 2005); *Katz Interactive v. Am. Airlines*, 639 F.3d 1303 (Fed. Cir. 2011))[4], or (c) as a matter of law the defendant is not liable in that the claim as drafted is not infringed via the defendant's use of the multi-sovereign gambit, *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282 (Fed. Cir. 2005).[5] Thus, by allowing the judge to handle the major legal issues first, the CAFCInformationAge Test freed up crucial judicial resources that would otherwise have been wasted wading into the electronics and operations to reach the legal issues.

For like reasons, since a non-electrical-engineer attorney can likewise read the claim, notice to the public is also further improved.

Thus, the CAFCInformationAge Test paired with the Markman jurisprudence allowed/required the patent attorney to claim in terms of commercially valuable results thus improving the lives of both the working federal judges and the public.[6]

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[3] ("Thomson neither performed every step of the claimed methods nor had another party perform steps on its behalf, and Muniauction has identified no legal theory under which Thomson might be vicariously liable for the actions of the bidders. . . . Thomson does not infringe the asserted claims as a matter of law.")

[4] *Amicus* Cook Br. 28-33.

[5] *Id.*

CLS Bank (the financial industry) would undo all that by sending us back to times past, where claims such as Alice's would be in the form of the machines, machine-states, and machine-state transformations that create the DATA which constitute the INFORMATION that is the commercially valuable results.

Electrical engineers, computer engineers, and even a handful of computer scientists, can claim in that way, but does the Court really want that?

If not, then this Court should adopt the CAFCInformationAge Test as A machine-or-transformation test appropriate to the Information Age ("InfoAge"), in general, and Intelligence Amplification ("IntellAmp") technologies in particular.

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[6] However, the seminal cases forming the CAFC InformationAge Test appear unclear due to the vocabulary that existed to describe the technology at the time they were decided. As shown herein, a newer formal DATA-INFORMATION vocabulary can be applied to these seminal cases to clarify that they form a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies.

I. A Complex Question Implying A False Dilemma—Either-Or Choice Between Software ("Not Hardware") And Hardware—Used To Argue That "Software" Matches A Definition Of "Abstract"; and a False (Neglected) Cause Used to Argue that Alice Lays Claim to Human Thinking Rather than to Machines/Machine-States/Machine-State Transformations Carefully-Engineered to Create DATA (Humanly-Perceivable Differences) Designed to Cause INFORMATION (Human Thinking)

CLS Bank (the financial industry) has convinced the courts that some of the most complex and power-intensive electrical circuitry and electrical circuitry operation known to mankind are somehow disembodied "abstract ideas."[7] How could that be?

There is precedent of this Court that yields a simple formula having the desired outcome (e.g., Alice's patent claims held invalid as drawn to patent in-eligible subject matter with nary so much as a claim construction):

> The categories of patent-eligible subject matter [—"process, machine, manufacture, or composition of matter"—] recited in § 101 . . .[are] limited by . . . judicially created exceptions. ". . . abstract ideas" are excluded from patent eligibility, *See Diamond v. Diehr*, 450 U.S. 175, 185, 101 S. Ct. 1048, 67 L. Ed. 2d 155 (1981), . . . *Gottschalk v. Benson*, 409 U.S. 63, 67, 93 S. Ct. 253, 34 L. Ed. 2d 273 (1972). Thus, even inventions that fit

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[7] Does charging a smartphone, notebook computer, or a desktop computer connected to the industrial power grid seem abstract?

> within one or more of the statutory categories are not patent eligible if drawn to . . . an abstract idea.
>
> . . .
>
> . . . If the invention falls within one of the statutory categories, we must then determine whether any . . . judicial exceptions nonetheless bars such a claim—is the claim drawn to a patent in-eligible . . . abstract idea? If so, the claim is not patent eligible. Only claims that pass both inquiries satisfy § 101.

CLS Bank Int'l v. Alice Corp. Pty, 717 F.3d 1269, 1276-1277 (Fed. Cir. 2013).

Formulaically, IF subject matter of claims can be made to match the definition of "abstract idea" in this precedent, THEN the claims are to "patent-ineligible" subject matter, and the "claim is not patent eligible". *Id.*

The financial industry has used three effective tools to make Alice's technologies match up with the definition of abstract ideas in this context,[8] thereby creating rhetoric that Alice's technologies constitute "unpatentable subject matter": (i) a complex question that presupposes some inchoate "invention" (e.g., some ineffable "software") somehow "implemented" in a "computer," said presupposition implying; (ii) a false dilemma (either-or choice between software ("not hardware") and hardware) used to construct an argument that "software" matches the dictionary definition of "abstract," when software is actually an engineering term used to distinguish the design choice of using computer programs to create special purpose circuits from reconfigurable but slower hardware versus the design choice of using circuit manufacturing techniques to create non-reconfigurable (but much faster) hardware; and (iii) a false (neglected) cause argument—confusing DATA (machine-generated differences above the threshold of human perception) for the INFORMATION (human thought, or mental states)—such DATA are designed to cause, and through such confusion arguing that Alice's claims are drawn to mental steps.[9] [10]

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[8] *See*, e.g., abstract ideas of *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1342-1343 (Fed. Cir. 2013) ("Members of both the Supreme Court and this court have recognized the difficulty of providing a precise formula or definition for the abstract concept of abstractness. . . . ('The Court . . . [has] never provide[d] a satisfying account of what constitutes an unpatentable abstract idea.')" (quoting, Stevens J., concurring, *Bilski v. Kappos*, 130 S. Ct. 3218, 177 L. Ed. zd 792 (2010)) and CLS *Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269, 1292 (Fed. Cir. 2013) (". . . abstract ideas—mental steps.").

Regarding the complex question and false dilemma argument, there is no inchoate "invention" (e.g., some ineffable "software") somehow "implemented" in a "computer." Software is an engineering term differentiating the use of slower reconfigurable hardware from faster non-reconfigurable hardware. Software is not abstract. Software and hardware are functional design equivalents.

Regarding the false (neglected) cause argument, IntellAmp patents do not lay claim to either first-order or second-order human thought. Rather, ***IntellAmp patents, like Alice's, lay claim to machines/machine-states/machine-state-transformations carefully engineered to create***

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[9] *Aristotle*, Sophistical Refutations Book I, Parts 1 and 4

[10] *Encyclopedia Britannica Online*, describing Aristotle's *Sophistic Refutations*:, accessed January 08, 2014, http://www.britannica.com/EBchecked/topic/200836/fallacy

structured DATA (machine-generated-tangible-differences),[11] ***said DATA structured in view of*** FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION (e.g., English language words which have concrete meaning to English-readers), ***and said DATA further structured in view of*** SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION (e.g., desired result of understood and humanly-useful currency trading concepts which the English reader gleans from the English words of Alice's IntellAmp claims). In IntellAmp technologies DATA (machine-generated-tangible-differences) are not thinking; rather, U.C. (machine-generated-tangible-differences) are structured to trigger, or cause, human thinking. ***IntellAmp patent claims are to machines that produce DATA, not to the thinking/meaning—INFORMATION—such DATA are structured to trigger in humans***.

All "abstract" arguments are false. The Court should hold Alice's claims are drawn to patent eligible subject matter because "software" is not abstract, and IntellAmp technologies use machines to create machine-generated-differences (DATA) structured to trigger human meaning/thinking and thus Alice's claims are to machines that produce DATA, not the human thinking such DATA might trigger.

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[11] "Tangible" meaning perceivable by humans via some technology such as voltmeter measurements, pixel brightness differences (LCD monitor), haptic differences (cell phone on vibrate), audio differences (cell phone with audible ringtone), etc.

II. A Complex Question Implying a False Dilemma: An Either-Or Choice Between "Hardware" and "Not Hardware" ("Software") Used To Construct An Argument That "Software" Matches A Definition Of "Abstract" And Is Thus Unpatentable, When In Fact "Software" is A Term to Distinguish the Design Choice of Reconfigurable (But Slower) Hardware from the Design Choice of NON-Reconfigurable (But Much Faster) Hardware

The financial industry has been able to generate confusion by the exploitation of a false choice between "hardware" and "software" ("not hardware") which has been deftly inserted into the Question Presented. This dilemma is false, and the Question Presented should be understood consistent with the technology.

The Question Presented recites "whether claims to computer-implemented inventions-including claims to systems and machines, processes, and items of manufacture . . ." The phrase "computer-implemented inventions" implies that there is some inchoate and disconnected "invention" which is just somehow "implemented" in a "computer."

The phrase "claims to computer-implemented inventions . . ." appears calculated to create the appearance of a "split nature" of such claims. By using "computer-implemented" as an adjective that is appended to "invention," a "computer" (*e.g.*, a hardware microprocessor) is made to seem like a generic or neutral component of "something else" (*e.g.*, "not hardware" ("software")) that "is" the "invention."

Why does this matter? Because when mischaracterized in this way—"software" as "not hardware"—but otherwise ill-defined, "not hardware" matches up with "abstract idea": "disassociated from any specific instance . . . expressing a quality apart from an object <the word poem is concrete, poetry is [abstract]>"). An abstract idea is one that has no reference to material objects or specific examples—i.e., it is not concrete." *Ultramercial* at 1342–43. This "similarity" leads to the conclusion that, as an abstract idea, "software" is unpatentable. But the hardware-software ("not hardware") dichotomy used to generate this "similarity" is false.

As shown below, what is called "software" is actually use of computer programs to create special purpose circuits from reconfigurable but slower hardware, and what is called "hardware" is actually use of circuit manufacturing techniques to create non-reconfigurable but much faster hardware.

In the absence of the false dichotomy "software" is patent eligible because electronic and computer engineers understand "software" as "slower hardware;" that is why a computer program can be converted to faster non-reconfigurable hardware as shown following.

III. Question Presented Should Be Understood In View of the Actual Technology–What is Called "Software" is Actually Use of Computer Programs to Create Special Purpose Circuits from Reconfigurable but Slower Hardware, and what is Called "Hardware" Is Actually Use of Circuit Manufacturing Techniques to Create Non-Reconfigurable but Much Faster Hardware: "Hardware"-"Not Hardware" ("Software") Dichotomy is False—Hardware and Software, Properly Understood, Are Functional Design Equivalents[12]

Amicus shows following that the "hardware"—"software" ("not hardware") dichotomy is false, even when traditional microprocessor methodologies are used. However, more recent tools make proving the falsehood of the software-hardware dichotomy that much easier.

A. "Hardware"-"Not Hardware" ("Software") Dichotomy is False: NEC's Cyberwork-Bench Tool Accepts As Input a Program Written in the Higher Level Language C and Outputs Functionally Equivalent Non-Reconfigurable Hardware Design

NEC's Cyberworkbench accepts as input a program written in the higher level computer language C and outputs a non-reconfigurable hardware design which functions equivalently to the C program. The non-reconfigurable hardware design may be implemented in Application Specific Integrated Circuits (ASICs), which are non-reconfigurable circuits formed in silicon and metal.

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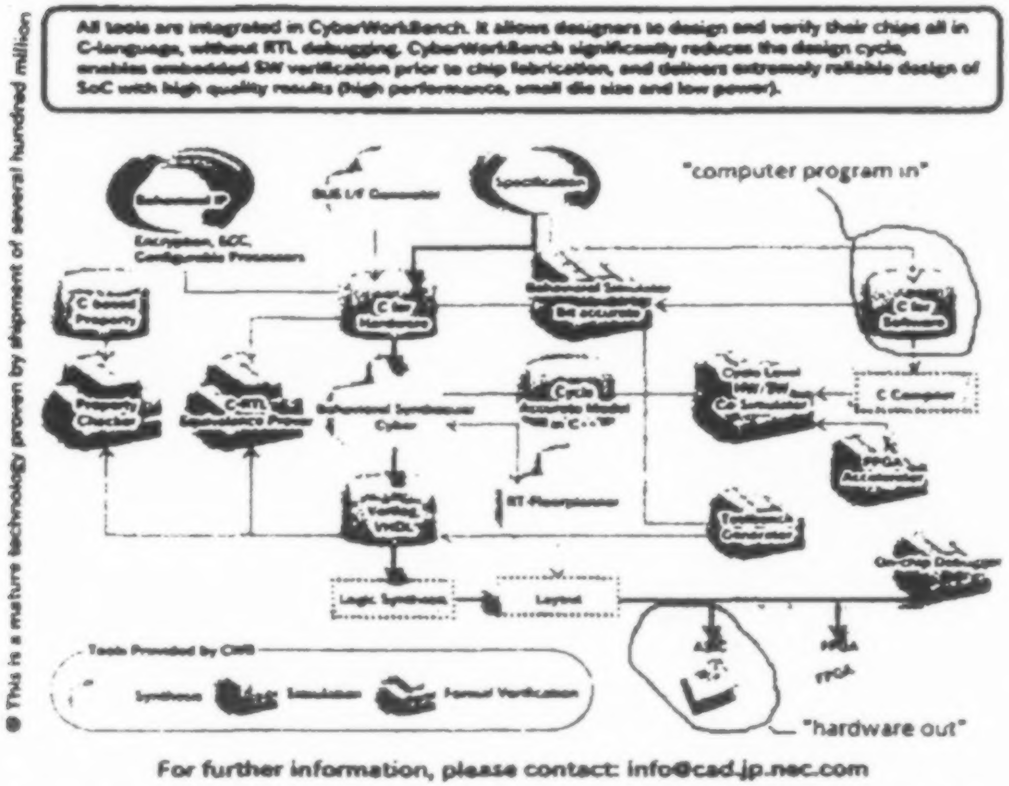
[12] Regarding all technology descriptions herein, please see Appendix A.

NEC's Cyberworkbench provides for direct translation of programs written in higher level computer languages direct to non-reconfigurable hardware (*e.g.*, ASIC hardware), thus directly demonstrating that the digital designs of computer programs (slower special purpose electronic circuits created from the reconfigurable electronic circuits of microprocessors via use of programs) may be equivalently implemented in non-reconfigurable electronic circuits (*e.g.*, ASICs).

NEC's Cyberworkbench datasheet illustrates its ability to convert a C program into a non-reconfigurable hardware equivalent. Shown (upper right) is the Cyberworkbench accepting as input a higher level programming language C program and producing as output (lower right) a non-reconfigurable hardware design:



All tools are integrated in CyberWorkBench. It allows designers to design and verify their chips all in C-language, without RTL debugging. CyberWorkBench significantly reduces the design cycle, enables embedded SW verification prior to chip fabrication, and delivers extremely reliable design of SoC with high quality results (high performance, small die size and low power).

® This is a mature technology proven by shipment of several hundred million

"computer program in"
Behavioral IP
Encryption, SOC, Configurable Processors
BUS I/F Generator
Specification
C based Property
C for Hardware
Behavioral Simulator
Bit accurate
C for Software
Property Checker
C-RTL Equivalence Prover
Behavioral Synthesizer Cyber
Cycle Accurate Model "SystemC++"
Cycle Level HW/SW Co-Simulator
C Compiler
FPGA Accelerator
RT Floorplanner
Verilog VHDL
Testbench Generator
On-Chip Debugger
Logic Synthesis
Layout
ASIC
FPGA
Tools Provided by CWB
Synthesis
Simulation
Formal Verification
"hardware out"

For further information, please contact: info@cad.jp.nec.com

http://edatechforce.com/wp-content/uploads/2011/02/CyberWorkBench-Datasheet.pdf.

NEC Cyberworkbench depicts a computer program converted directly to equivalent non-reconfigurable hardware. The either-or hardware-software dilemma is thus seen to be false.

B. "Hardware"-"Software" ("Not Hardware") Dichotomy is False: Program Written in the Higher Level Language C May be Partially Implemented in Non-Reconfigurable Hardware and Partially Implemented In "Software" (*e.g.*, Special Purpose Electronic Circuits Assembled via Encoded Voltages of Computer Program Interacting With Reconfigurable Electronic Circuits of A Microprocessor/VLSIC)

Parkinson's Figure 1 and the associated text of their article *C to VHDL Converter in a Codesign Environment*, available at http://www.cse.unsw.edu.au/~sridevan/index_files/00323960.pdf, illustrate a computer program written in the higher level programming language C equivalently implemented in a working system composed of a combination of (i) NON-reconfigurable electronic circuits ("hardware" the right-hand path of Parkinson's Figure 1) and/or (ii) reconfigurable electronic circuits ("software"—special purpose electronic circuitries sequentially created by encoded voltages of a computer program interacting with the millions of recon-figurable electronic circuits provided by a VLSIC/microprocessor—the left-hand path of Parkinson's Figure 1).

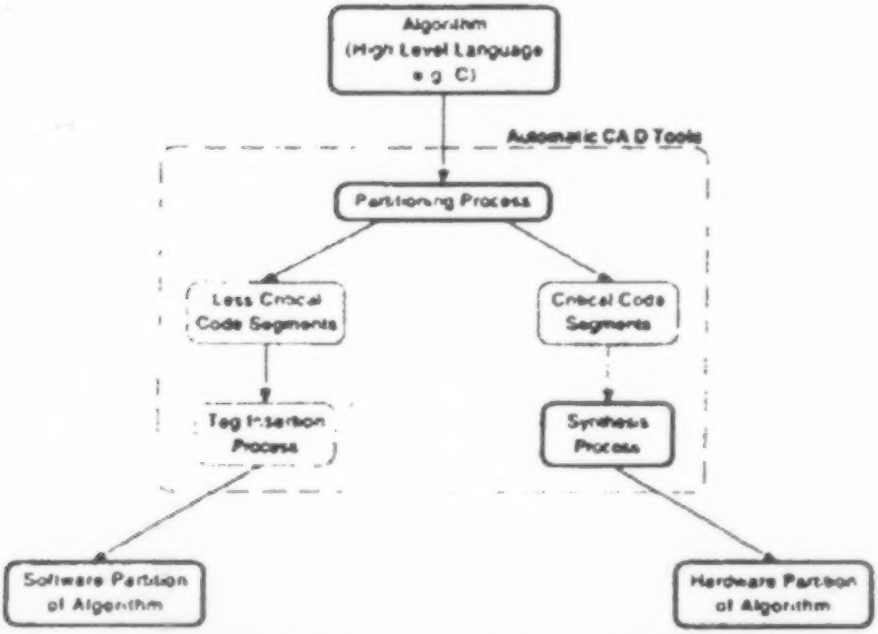

Algorithm
(High Level Language
e.g. C)
Automatic CAD Tools
Partitioning Process
Less Critical
Code Segments
Critical Code
Segments
Tag Insertion
Process
Synthesis
Process
Software Partition
of Algorithm
Hardware Partition
of Algorithm

Figure 1 - Automated Hardware/Software Codesign Methodology

For example, as explained in their article, tools such as C to Very-High-Speed-Integrated-Circuit Hardware Description Language (VHDL) converters accept as input a program written in the higher level computer language C, and produce as outputs files written in VHDL. The VHDL files are then input into logic synthesis tools which read the VHDL and output a non-reconfigurable hardware design. The non-reconfigurable hardware design may be implemented in ASICs, which are non-reconfigurable electronic circuits formed in silicon and metal.

The non-reconfigurable hardware can then be interfaced with the special purpose electronic circuits via the encoded voltages of computer programs interacting with the reconfigurable electronic circuits provided by a microprocessor/VLSIC to desired effect. For example, as explained by Parkinson et al, the parts of the C program for which speed is particularly important are implemented in non-reconfigurable hardware, while the parts where speed is not as critical are implemented in software (reconfigurable hardware under program control).

The "either-or" hardware-software dilemma is thus seen to be false. Hardware and software (programmatic use of slower but reconfigurable hardware) represent design choices that may in fact be combined.

C. "Hardware"-"Not Hardware" ("Software") Dichotomy is False: Program Written in the Higher Level Language C → Vendor-Specific Compiler → Binary Instructions for Vendor Specific Microprocessor/VLSIC = Voltages Applied in Parallel to the Pins of a Vendor-Specific VLSIC/Microprocessor To Assemble, Operate, and Save Outputs of Sequences of Hardware Designs at the Rate of Millions Per Second

In operation, a higher level computer language program, such as one written in the C programming language, is translated (compiled) into the binary instructions appropriate to the Instruction Set Architecture-microarchitecture of the vendor specific (*e.g.*, Intel, NEC, AMD, etc.) microprocessor in use. These binary instructions actually represent voltages that are applied in parallel to the microprocessor.

To understand that the "hardware"-"software" dichotomy is false, it helps to keep in mind that a microprocessor is a Very Large Scale Integrated Circuit (VLSIC) having a collection of re-configurable (slower) circuit components activatable by applied voltages; ***in the absence of a program the VLSIC/microprocessor is inert***. It also helps to keep in mind that a "computer program" consists of encoded voltage levels that turn transistors on and off in a VLSIC/microprocessor; ***in the absence of the appropriate type of microprocessor/VLSIC a computer program is inert.***

Any digital logic design of a computer program, in order to work in the real world, must be such that it can compile to voltages that will work with the circuitries of a vendor specific microprocessor.

A microprocessor/VLSIC contains millions of electronic transistors and resistors. The VLSIC/microprocessor is engineered such that its electronic transistors can be selectively activated—just like flipping an on-off light switch in a room—to create special purpose analog electronic circuits which can accept electrical inputs and produce electrical output in ways that "mimic" or "stand in" for certain defined human-semantic logical operations. The defined human-semantic logical operations which a microprocessor's/VLSIC's special circuits can mimic are called "instructions." ***Taken together, the defined human-semantic logical operations and the hardware engineering of the VLSIC/ microprocessor that is necessary to produce the special circuits that when operated within engineering parameters can mimic the defined human-semantic logical operations are called the Instruction Set Architecture-micro-architecture ("ISA-microarchitecture") of the micro-processor/VLSIC. The ISA-micro-architecture is vendor specific***, so an Atmel microcontroller's ISA-microarchitecture is different than an Intel microprocessor's ISA-microarchitecture.

Activating and/or setting the inputs of the special purpose circuits which mimic the defined human-semantic logical operations ("instructions") of the VLSIC/microprocessor is typically done via voltages applied in parallel to metallic traces ("bit lines") which connect with metallic pins, each of which electrically connect with the VLSIC which make up the microprocessor. For example, with respect to the Atmel microcontroller, see *Amicus* D. Cook Br. 28-33, 8 voltages are applied in parallel to activate specific instructions of the Atmel microcontroller.

The circuits of the microprocessor/VLSIC are analog—as are all circuits—but are engineered in view of a special convention which allows the analog circuits to mimic human semantic digital logic. For example, in one type of circuit implementation ("Resistor-Transistor logic"), 0.0 to +0.8 measured volts, by convention, is treated as "standing for" human-semantic logical zero, and measured +2.0 to + 5.0 volts, by convention, is treated as "standing for" human-semantic logical one. The voltages can thus be "treated as" (encoded as) "strings" of "binary" symbols, but electrical and computer engineers understand that such strings specify voltage levels that open and close transistors of the VLSIC/ microprocessor to create or set the inputs of the special purpose circuits which mimic the human-semantic logic of the Instruction Set Architecture of the microcontroller/VLSIC.

Control of the circuitry of the VLSIC/microprocessor consists of a sequence of a number of encoded voltage levels—*e.g.*, a sequence of eight parallel voltage levels for the Atmel processor. When such a sequence is constructed to achieve a humanly useful and meaningful (concrete meaning to a human) output of circuits (tangible machines) and associated voltage transitions (transformations) via clever use of the special purpose electrical circuits-associated human-semantic instructions that make up the Instruction Set Architecture, such an encoded sequence of voltage levels is denoted as a "computer program." There is nothing abstract about a sequence of 8 voltages to be applied in parallel to metallic traces known as bit lines such as for the Atmel 8-bit processor.

Modern microprocessors/VLSICs can execute their instructions at the rate of millions per second. Since each instruction has an accompanying electronic circuit that "stands for" the human-semantic logic instruction, it follows that the computer programs are creating, using, and tearing down hardware designs (electronic circuits) from the electronic circuit components of vendor specific microprocessors/ VLSICs at the rate of millions per second.

The either-or "hardware"-"software" dilemma is thus again seen to be false.

D. The Question Presented Should Be Viewed In Light of the Actual Technology—"Hardware" and "Software" Represent Functionally Equivalent Design Choices—"Software" is An Engineering Term Denoting Use of Computer Programs to Create Special Purpose Circuits from Reconfigurable but Slower Hardware, "Hardware" Is An Engineering Term Denoting Use of Circuit Manufacturing Techniques to Create Non-Reconfigurable but Much Faster Hardware

Amicus hopes the Court will recognize that engineers understand that the digital designs of higher order computer language (*e.g.*, C) programs can be equivalently implemented via general purpose microprocessor/VLSIC reconfigurable circuit techniques, non-reconfigurable circuit techniques (e.g., Application Specific Integrated Circuits), or some combination thereof (e.g. hardware software co-design such as detailed in above-described *C to VHDL Converter in a Codesign Environment*).

Properly understood, "software" is not abstract.

IV. A False (Neglected) Cause: Information "From Nothing" Versus Engineering Reality: IntellAmp Technologies Use Carefully Engineered Machines/Machine-States/Machine-State Transformations to Create DATA (machine-generated-tangible-differences) Structured In View Of FIRST-ORDER-Human-Thought-SYMBOL-INFORMATION (e.g., English Language Symbols Which Have Concrete Meaning To English Reader), And SECOND-ORDER-Human-Thought-CONCEPT-INFORMATION (e.g., Result Of Understood And Humanly-Useful Currency Trading Concepts Which Engineers Ultimately Hope To Trigger)

Regarding the neglected cause argument, things are slightly more complex. The Court is likely familiar with the mind-bending concepts of Semiotics—the study of signs as opposed to that which they signify, BUT there is yet a further distinction that arises in very precise semiotics as well as IntellAmp technologies: the distinction between the sign vehicle (one or more humanly-perceivable machine-generated differences—DATA), the sign (first-order human thought, e.g., DATA interpreted as English language words by humans who understand English—

FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION), and the signified (second-order human thought, e.g., such as would be understood from the English words of Alice's claims by English-readers who further work in the highly complex world of international currency trading -- SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION). Noth, *Handbook of Semiotics* 79-80 (1995).

Engineers usually work with "information" as that term is used in Shannon and Weaver's Mathematical Theory of Communication, traditionally referred to as "information theory," but better described as "data theory" outside of engineering as explained herein. As used by engineers, "information" is neither signifier (FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION) nor signified (SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION). Rather, it is "something else"—what precise semiotics calls the "sign vehicle": "In information theory, the term *signal* corresponds to the sign vehicle of semiotics. This signal . . . is opposed to the sign since it is only its physical embodiment." *Id.*

"From a semiotic point of view, Shannon & Weaver's. . . communications models do not represent signs as one of their elements. Not signs but signals are transmitted in the process of communication. ***Signals are only the energetic or material vehicles of signs, and their physical form. In this sense, a signal is a physical event, while a sign is a mental process.*** " *Id* at 174.

As explained in herein, the signals ("information") of "information theory"—machine generated differences that humans can perceive by some technological means—are better referred to as DATA outside of engineering.

Thus, IntellAmp technologies are difficult to understand even when the goal is understanding. But the financial industry's goal is to win, so it has confused the issues. This confusion can be remedied by use of this chain: engineer-designed machines create structured DATA,[13] said DATA are structured to generate FIRST-ORDER-human-thought-***SYMBOL***-INFORMATION (e.g., English language words which have concrete meaning to English-readers), and said DATA are further structured to generate SECOND-ORDER-human-thought-***CONCEPT***-INFORMATION (e.g., result of understood and humanly-useful currency trading concepts gleaned from the English words). [14] So, engineers CREATE MACHINES to generate DATA structured to function as first-order English symbols AND generate second-order logical concepts at the same time—IntellAmp technology really is that complicated.

The financial industry has been able to generate even more confusion by the conflation of a real dichotomy between "engineering" information (as in

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[13] Data are machine-generated-tangible-differences, where "tangible" means perceivable by humans via some technology such as voltmeter measurements, pixel brightness differences (LCD monitor), haptic differences (cell phone on vibrate), audio difference (cell phone with audible ringtone), etc.

[14] See Appendix B example where varying brightness pixels (machine states) that form words of Spanish language remain DATA to human who does not understand Spanish, but becomes INFORMATION (meaning, thoughts) when the machine states are transformed e.g. brightnesses varied such brightnesses understood to form words of English language (first-order thought) when viewed by a human who does understand English, such words further understood as conveying a useful and concrete meaning (second-order thought) in a human who further understands currency trading.

Alice's claims, and as data communications engineers use the term) and "ordinary" everyday information (the way normal people use the term). This dichotomy is real, but confusion can be avoided due largely in part to the newer vocabulary invented by Professor Luciano Floridi in his article, "Semantic Conceptions of Information", *The Stanford Encyclopedia of Philosophy* (Spring 2013 Edition), Edward N. Zalta (ed.), URL =<http://plato.stanford.edu/archives/spr2013/entries/information-semantic/>.

A. Adoption Of Professor Luciano Floridi's Newer Formal Vocabulary Recognizing That DATA (Machine-Generated Differences) "Causes" INFORMATION (Concrete Meanings In The Mind Of The Human Perceiving The DATA) Helps See Through The False Cause Of Such Concrete Meanings Arising "From Nothing"

Data communications engineers' use of the term "information" ("engineering-information")—e.g., consistent with Shannon's Mathematical Theory of Communication (MTC)—can be very confusing because it is so different from the way normal people use the term. In engineering-information, psychological/mental states are irrelevant. Engineering-information is not information in the ordinary sense of the word. "Engineering-information" has an entirely technical meaning: information without human meaning, such as would be transmitted over a fiber optic cable or telegraph wire. Floridi, *Semantic*, § 2.2. "The 'goal [of engineering information] is to . . . eliminate the psychological factors involved' . . . subtract human knowledge from the equation" J. Gleick, *Information: A History, A Theory, A Flood* 200-

201 (2011). "Shannon . . . declared meaning to be 'irrelevant to the engineering problem.'" *Id* at 416.

But, in engineering references, the term used is typically just "information"—as such term is used in Alice's claims—even though what is meant is "engineering-information"; information devoid of all human-semantic meaning such as might be transmitted over a telegraph wire. This unfortunate identity of terms for radically different things (engineering-information versus "ordinary" information), can be used, as the financial industry has done here, to argue that IntellAmp claims are drawn to "ordinary" information: human-semantic meaning, or human thought.

Why does this matter? Because in this way it can be argued that IntellAmp patents claim ordinary "information" or "human-semantic meaning" which matches up with "mental steps" which are ". . . abstract ideas" and hence are drawn to unpatentable subject matter. *CLS Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269, 1292 (Fed. Cir. 2013) ("abstract ideas—"mental steps").

This is false. One way to see that it is false is to adopt Professor Floridi's consistent use of "DATA" instead of "engineering-information" and use of "INFORMATION" as "ordinary" information and as such term is commonly used outside of engineering.

The dichotomy is real and is heavily used in IntellAmp technologies. IntellAmp patents claim machines/machine-states/machine-state transitions that generate DATA (humanly-perceivable[15] differences) that is structured to cause INFORMATION (e.g., first-order (symbol meaning) and second-order (concept meaning)) in some pre-defined group of humans (e.g., humans who understand English-language symbols and who further understand currency trading concepts).[16]

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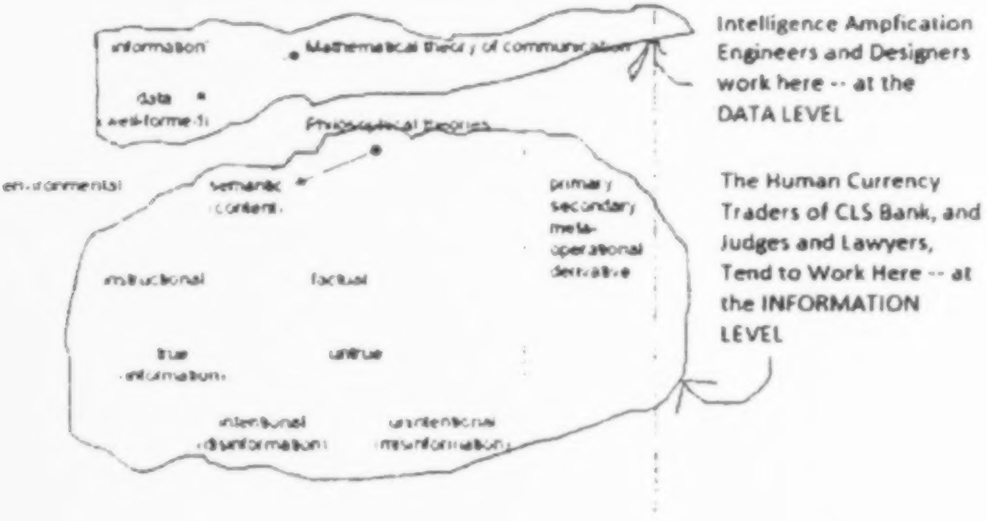
[15] e.g., via technology such as voltmeter measurements, pixel brightness differences (LCD monitor), haptic differences (cell

Floridi has created a map showing the concept of semantic information as "meaningful data":


information
Mathematical theory of communication
data
(well-formed)
Philosophical theories
environmental
semantic
(content)
primary
secondary
meta-
operational
derivative
instructional
factual
true
(information)
untrue
intentional
(disinformation)
unintentional
(misinformation)

Intelligence Amplfication Engineers and Designers work here -- at the DATA LEVEL

The Human Currency Traders of CLS Bank, and Judges and Lawyers, Tend to Work Here -- at the INFORMATION LEVEL

The financial industry hopes to confuse the DATA and INFORMATION levels thus leading the Court to conclude Alice claims INFORMATION (abstract ideas), but Amicus—with Professor Floridi's help—

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phone on vibrate), audio differences (cell phone with audible ringtone), etc.

[16] "The moment one transforms that set of signals [machine states] into other signals [human perceptions] our brain can make an understanding of [concrete meaning, or human thought], *then* information is born—it's not in the beeps [machine states]."" Gleick, *Information*, p. 249 "It takes a human—or, let's say, a 'cognitive agent'—to take a signal [data] and turn it into information . . . we *invest* stimuli with meaning, and apart from such investment, they are informationally barren." *Id*. 416-7.

seeks to help the Court keep straight that Alice's claims are drawn to machines (electronic circuits)/ machines-states (e.g., voltages of electronic circuits)/ transitions of machine-states (e.g., transformation of voltage state levels from 0.0-0.8 to 2.0-5.0 measured volts) that create DATA (MACHINE-GENERATED-TANGIBLE-DIFFERENCES), structured to cause INFORMATION in some pre-defined group of humans (e.g., humans who understand English-language symbols and who further understand currency trading concepts).

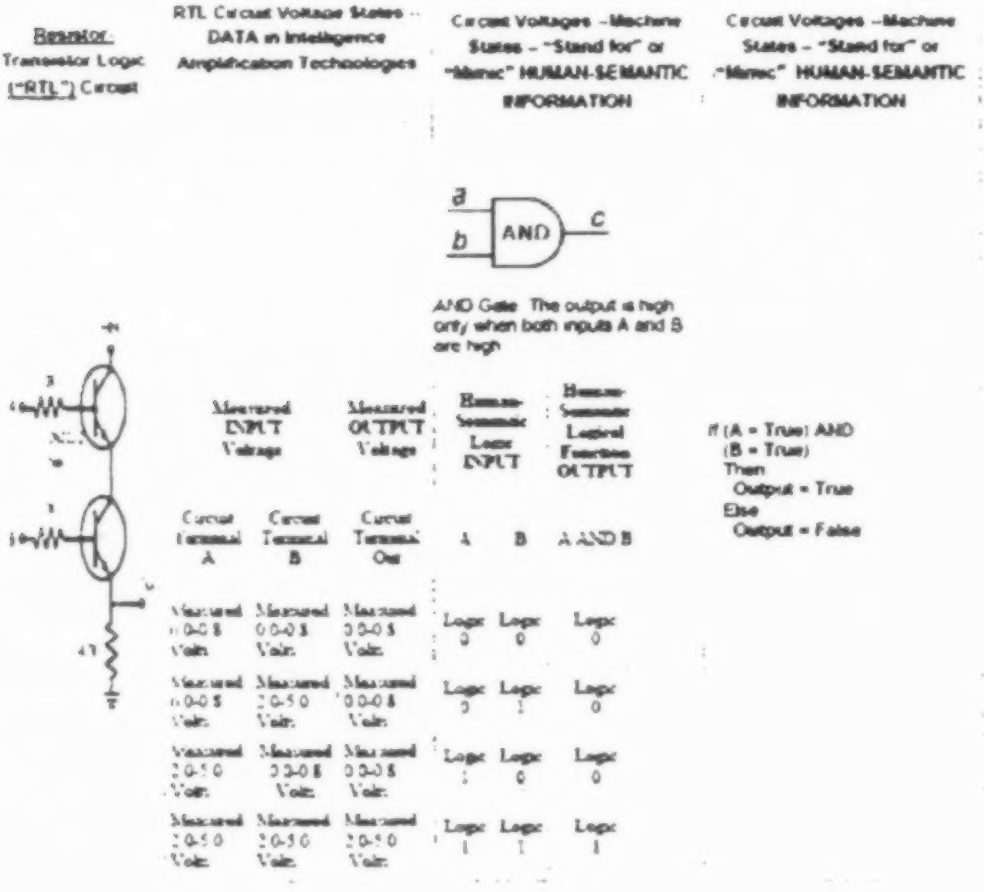
B. IntellAmp Technologies Rely On Engineering Techniques To Activate Human Subjectivity Through Carefully Controlled And Engineered Machine Objectivity

IntellAmp technologies augment/improve the intelligence of humans (such as the human currency traders of CLS bank) via engineering of electronic circuits (machines) to create DATA (plural of DATUM). A datum is a difference that can be perceived by a human via one of the 5 human senses (*e.g.*, sight, hearing, touch, taste, smell). Floridi, *Semantic*, S 1.3; Gleick, *Information* p. 161.

IntellAmp technologies use conventions such that the DATA can "stand for" some defined human-semantic meaning (INFORMATION). For example, the following table shows how ANALOG electronic circuit voltages—DATA—and an accompanying set of conventions allow the ANALOG electronic circuit voltages to "stand in for," or mimic, two-valued (*e.g.*, DIGITAL) human-symbolic logics (*e.g.*, Boolean logics or equivalently natural-language-like "if then" conditional logic statements). ***These techniques are fundamental, and still form the basis of InfoAge***

and IntellAmp technologies, such as Alice's, albeit via increased design complexities by factors that likely number in the trillions:[17]

If patent attorneys return to drafting claims in the lexicon of electrical engineering, LIKE YOU JUST DID, judges and juries will try to skip over engineering-speak. Does the court really want to read



Resistor-Transistor Logic ("RTL") Circuit	RTL Circuit Voltage States -- DATA in Intelligence Amplification Technologies			Circuit Voltages – Machine States – "Stand for" or "Mimic" HUMAN-SEMANTIC INFORMATION			Circuit Voltages – Machine States – "Stand for" or "Mimic" HUMAN-SEMANTIC INFORMATION
				AND Gate The output is high only when both inputs A and B are high			

	Measured INPUT Voltage		Measured OUTPUT Voltage	Human-Semantic Logic INPUT		Human-Semantic Logical Function OUTPUT	If (A = True) AND
							(B = True)
							Then
							Output = True
							Else
							Output = False

	Circuit Terminal A	Circuit Terminal B	Circuit Terminal Out	A	B	A AND B	
	Measured 0.0-0.8 Volts	Measured 0.0-0.8 Volts	Measured 0.0-0.8 Volts	Logic 0	Logic 0	Logic 0	
	Measured 0.0-0.8 Volts	Measured 2.0-5.0 Volts	Measured 0.0-0.8 Volts	Logic 0	Logic 1	Logic 0	
	Measured 2.0-5.0 Volts	Measured 0.0-0.8 Volts	Measured 0.0-0.8 Volts	Logic 1	Logic 0	Logic 0	
	Measured 2.0-5.0 Volts	Measured 2.0-5.0 Volts	Measured 2.0-5.0 Volts	Logic 1	Logic 1	Logic 1	

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[17] *Amicus* synthesized table from the sources of Appendix A, and this **interactive** "Basic Gates" page: http://hyperphysics.phy-astr.gsu.edu/hbase/electronic/gate.html #c1; there are many types of logic gate circuits which can be explored on this page. Basic pattern is to click the symbol of the logic gate, then on the resulting page click the "how do you make one" link.

claims like that (as in times past)? If not, the Court should adopt the CAFCInformationAge Test.

The preceding table shows that the analog electronic circuit—paired with the convention of assigning 0.0-0.8 volts to human-semantic "false" and 2.0-5.0 volts to human-semantic "true"—allow the voltages arising from circuit operation to "stand for" or "mimic" the human-symbolic "digital" "If-Then" conditional logic of computer programming or Boolean Truth Tables. ***Today's hyper-complex microprocessors/ VLSICs are built using this and similar circuits over and over. IntellAmp typically uses higher-level programs that assemble combinations of the microprocessors/VLSIC instructions to mimic yet-higher-level human semantic logic (e.g., currency trading). Thus, if the Court can understand this single example, the Court can understand VLSIC/microprocessor and related IntellAmp technologies***.

IntellAmp patent claims are not to human thinking, but instead to the machines (electrical circuits)/ machine-states (electrical circuit voltages)/ machine-state transformations (transitions of voltage levels) perceivable by a human (DATA), said DATA structured to create a concrete meaning in the mind of a human observer (INFORMATION).

V. CONCLUSION

A. The CAFC's Decision of Alappat Encodes That Either-Or Hardware"-"Software" ("Not Hardware") Dilemma is False, and is Thus a Machine-or-Transformation Test Appropriate to the Information Age

Alappat, 33 F.3d 1526 (Fed. Cir. 1994), recognizes that the hardware-software either-or dilemma is false, and allows pure (non-hybrid) Info Age machine statutory class claims but without the legal dilemmas of the CAFCIndustrialAge Test:

> Alappat admits that claim 15 would read on a general purpose computer [microprocessor] programmed to carry out the claimed invention, but argues that this alone also does not justify holding claim 15 unpatentable as directed to nonstatutory subject matter. We agree. ***We have held that such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software.***

Alappat, 33 F.3d 1526, 1544-1545 (Fed. Cir. 1994).

The Court should thus adopt *Alappat* as a Machine-or-Transformation test appropriate to the Info Age on at least this basis.

B. Applying the DATA-INFORMATION Vocabulary to CAFC Decisions Made in Specific Response to IntellAmp Technologies Produces an IntellAmp Machine and/or Transformation Test Immune to Attorney Argument That Claims Are Drawn To "Abstract Ideas" (INFORMATION) When Such Claims Are Actually Drawn To Machines/Machine-States/Machine-State Transformations That Create DATA (Tangible (Perceivable)[18] Differences) Structured to Cause INFORMATION (Concrete Human Meanings) In The Mind Of A Human Reader [19]

The CAFC decided two of the seminal CAFCInformationAge Test cases in direct response to IntellAmp technology complexity: *AT&T v. Excel*, 172 F.3d 1352 (Fed. Cir. 1999)—holding pure (non-hybrid) statutory-process-class claims to IntellAmp patentable subject matter under 35 USC § 101; and *State Street Bank*, 149 F.3d 1368 (Fed. Cir. 1998)—holding pure (non-hybrid) statutory-machine-class claims to IntellAmp patentable subject matter under 35 USC § 101.

The CAFCInformationAge Test avoids confusion by letting judges work in terms of the humanly useful end result (INFORMATION, or human meaning), secure that if such result is from computer/ communications engineering, what is actually being claimed are machines (electrical circuits)/machine-states (voltages)/transformations of voltages (transitions of voltages) that produce DATA (tangible differences) which a human would interpret as the INFORMATION (concrete meaning) found useful.

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[18] While not always visible to the naked eye, machine state changes are humanly-perceivable even on small chips through the use of various technologies.

[19] See Appendix B example where varying brightness pixels (machine states) that form letters of Spanish language remains DATA to human who does not understand Spanish, but becomes INFORMATION (meaning, thoughts) when recast as English and viewed by a human who understands English.

Using the DATA-INFORMATION vocabulary, *AT&T v. Excel* may be read as holding that if a pure-process-statutory-class IntellAmp claim is drawn to a useful and concrete result (INFORMATION), such is statutory subject matter if the patent discloses the use of machine-generated process DATA (e.g., humanly-perceivable (tangible) machine-states (electrical circuit voltages)/machine-state transitions (transformations of electrical circuit voltages)) structured to cause the useful and concrete results (INFORMATION) in the mind of a human:[20]

> As previously explained, ***AT&T's claimed process employs subscribers' and call recipients' PICs as data***, applies Boolean algebra ***to those data to determine the value of the PIC indicator***, and applies that value through switching and recording mechanisms ***to create a signal useful for billing purposes***. . . .
>
> . . .
>
> . . . understanding of ***transformation*** is consistent with our earlier decision in

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[20] See Appendix C example of red-black dominos machine-state transitions/transformations causing Tangible (humanly perceivable) result, which causes Concrete meaning (human thought or meaning to one who understands English) which humans find Useful.

> Arrhythmia, . . . Arrhythmia's process claims included various mathematical formulae to analyze electro-cardiograph signals to determine a specified heart activity. . . .. The Arrhythmia court reasoned that the method claims qualified as statutory subject matter by ***noting that the steps transformed physical, electrical signals from one form into another form***—a number ***representing a signal related to the patient's heart activity***, a non-abstract output. . . . The finding that the ***claimed process "transformed" data [perceivable voltages, or machine-states] from one "form" to another*** simply confirmed that Arrhythmia's method claims ***satisfied § 101*** because the mathematical algorithm included within the process was applied to produce a number which had had **specific meaning**—a **useful, concrete [meaning]**, [arising from] tangible [(perceivable) machine-generated differences].

AT&T v. Excel, 172 F.3d 1352, 1358-1359 (Fed. Cir. 1999).

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *AT&T* as part of a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies that holds that if a pure-process-statutory-class claim's plain English is drawn to a useful and concrete result (e.g., causes meaning, "who owes what regarding phone bills" in the mind of the judge—INFORMATION), such is statutory subject matter if the patent discloses humanly-perceivable (tangible) machine-states (electrical circuit voltages)/ machine-state transitions (transformations of electrical circuit voltages) that cause DATA (e.g., "logged history" of machine-state (voltage) transitions/ transformations, or process) that can be interpreted as INFORMATION in the mind of the judge.

Using DATA-INFORMATION vocabulary, *State Street* may be read as holding that if a pure-machine-statutory-class IntellAmp claim is drawn to a useful and concrete result (INFORMATION), such is statutory subject matter if the patent discloses the use of machine-generated DATA (e.g., humanly-perceivable machine-states (electrical circuit voltages) /machine-state transitions (transformations of electrical circuit voltages)) to cause the useful and concrete result (INFORMATION) in the mind of a human:

> Today, we hold that the ***transformation of data [machine-generated differences engineered such that human would understand them as] representing discrete dollar amounts, by a machine through a series of [machine-states that "stand in for" or "mimic"] mathematical calculations*** . . . constitutes . . . [patentable subject matter] ***because it produces [humanly perceivable, or tangible, machine-states that "stand in for" or "mimic"] "U"—a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades*** [—concrete human-semantic meaning, INFORMATION, such information economically useful to the human].

State Street, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *State Street Bank* as part of a machine-or-transformation test appropriate to the InfoAge and IntellAmp technologies that holds that if a pure-machine-statutory-class claim's plain English is drawn to a useful and concrete result (e.g., causes meaning "share price" in the mind of the judge—INFORMATION), such is statutory subject matter if the patent discloses humanly perceivable (tangible) machines (electrical circuitries)/machine-states (electrical circuit voltages)/machine-state transformations (transitions of electrical circuit voltages) that are engineered to create DATA that can be interpreted as INFORMATION in the mind of the judge.

As shown, the Court—through use of DATA-INFORMATION vocabulary—could thus adapt *AT&T* and *State Street* to be a Machine and/or Transformation test appropriate to the InfoAge, and in particular to IntellAmp Technologies.

C. *Allapat, AT&T v. Excel*, and *State Street Bank* Form An IntellAmp Technologies Machine-or-Transformation Test that Improves Public Notice in View of the Technical Expertise of the Patent and Trademark Office ("PTO") and Improves Judicial Efficiency of Post-Issuance Interpretation Consistent with *Markman* Jurisprudence

The CAFCInformationAge Test allows attorneys to claim electronic circuits (machines)/ electronic circuit voltages (machine states)/ electronic voltage transitions (transformations of machine states) via natural English language particularly well suited to the practical two-stage approach that the United States Government ("Government") takes to patent claims.

In the first stage (pre-patent claim issuance), the Government requires that the PTO ensure that the technical subject matter undergirding the attorney's claims to legal monopoly be new (*e.g.*, 35 U.S.C. § 102) and that what is new is non-trivial (*e.g.*, 35 U.S.C. § 103). If the patent attorney is able to establish that the technical subject matter of her client's patent claims is new and non-trivial, the patent issues.

In the second stage (post-patent claim issuance), under Markman jurisprudence, a member of the Federal Judiciary finally gives interpretation to that in which the attorney's client is most intensely interested: the claim to exclude others (35 U.S.C. § 154) via patent infringement lawsuits (35 U.S.C. § 271(a), (b), and (c)) from commercial use of the client-owned technologies (e.g., technologies which a person who works in the technical field would find implicated by the words of the claim) via interpretation of the contours of the legal monopoly claimed. Thus, the United-States system conserves judicial resources by barring from issuance, and thus judicial interpretation, claims to legal monopolization of technical subject matter that is not really new.

The CAFCInformationAge Test allows a patent attorney to draft claims to IntellAmp technologies—circuits (machines)/circuit voltages (machine-states)/ voltage transitions (machine-state transformations)—in the form of natural English language. The attorney—through her technical training as verified by registration with the PTO—knows that IntellAmp technologists often describe their electronic circuits/ processes in very-constrained sub-sets of natural English language (e.g., conditional "if then" natural-language-like computer-programming statements such as briefly discussed herein in the context of the circuits that "stand for" the human-semantic Boolean AND function) and thus expects that a patent examiner will interpret the natural English language as "standing in" for the requisite new IntellAmp technical subject matter.

The CAFCInformationAge Test strengthens the statutory notice function of the patent claims by allowing the attorney—through her legal training, experience, licensure by her respective state bar admissions, and in particular her close attention to the courts' patent jurisprudence—to draft her claims to legal monopoly in the form of natural English language instead of the specialized vocabulary of computer programs as they actually are (e.g., sequences of voltage levels), microprocessors/VLSICs, transistors, capacitors, circuits standing for logic gates, ASICS, etc. which the natural English represents.

That is, the CAFCInformationAge Test allows the attorney to draft a natural English language claim to legal monopoly such that a Federal Judge—and the public—can construe the overall contours of the claims to legal monopoly in view of the patent statutes and extant relevant judge-made law (*e.g.*, via rules very analogous to those which the judge routinely uses to legally construe legal statutes and/or legal contract language) but without first wading into the mind-bending minutiae of the electronics.

But that clarity comes in exchange for an expected quid pro quo: the attorney expects that once the Federal Judge has finished construing the overall contours of the claims to legal monopoly, the Federal Judge will interview those who routinely work in the technical field to determine what technologies—e.g., the machines/machine-states/machine-state transformations of IntellAmp technologies—the natural English language of the claims really "stand in" for, and thereafter substitute the understood technical meaning for the natural language. Effectively, the drafting attorney expects that the judge will back into that technical subject matter about which the patent examiner was concerned during patent examination.[21]

If this most important step of "backing into" the technical subject matter really encompassed by the claim is skipped, and especially in IntellAmp technologies such as Alice's, claim construction stops and confusion arises from the free-floating natural English language of the claims leading one to the erroneous conclusion that they are related to "abstract ideas"—*e.g.*, free-floating human mental constructs for which no one can get paid.

However, if this most important second step is done, the Question Presented becomes tautological: When properly construed, Alice directly claims electronic circuits (machines), mapped states of the electronic circuits (processes), and media bearing signals which will generate electrical voltages (such media being articles of manufacture) which by definition are statutory subject matters. This is why applying the CAFCIndustrialAge Test to such claims as a test for patentability results in an apparent legal dilemma[22]—

---

[21] Like contract construction, except that once the judge has construed the overall legal contours, she determines the meanings of disputed terms of patent claims more like statutory construction—based on what disputed terms would have objectively meant to one of skill in the technologies. *Markman v. Westview Instruments*, 52 F.3d 967, 987 (Fed. Cir. 1995).

[22] See *Amicus* D. Cook Br. p. 32 ("DILEMMA: For processes-emergent-from-program assembled- machines-in-operation-OR-program-assembled- machines-proper, the CAFCIndustrialAge

the claims are already drafted to machines (*e.g.*, massive configurations of special purpose electrical circuits) and transformations (*e.g.*, processes describing the humanly-perceivable transformations of voltage level inputs to voltage level outputs). Since the claims ALREADY encompass machines and transformations, requiring that the claims encompass additional machines and transformations beyond those which they already claim directly gives rise to much confusion.

Alappat, 33 F.3d 1526, 1544 (Fed. Cir. 1994), can be read as part of a machine-or-transformation test appropriate to the InfoAge and IntellAmp technologies that recognizes that the hardware-software dichotomy is false, and allows pure (non-hybrid) machine statutory class claims to InfoAge technologies without the legal dilemmas of the hybrid claims required by the CAFCIndustrialAge Test.

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *AT&T v. Excel*, 172 F.3d 1352 (Fed. Cir. 1999) as part of a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies that allows pure-process-statutory-class claims to InfoAge and IntellAmp technologies without the legal dilemmas of the hybrid claims required by the CAFCIndustrialAge Test.

Using the newer formal DATA-INFORMATION vocabulary as demonstrated herein, the Court can read *State Street Bank*, 149 F.3d 1368 (Fed. Cir.

Test seems to require that an attorney achieve patentable subject matter at the expense of claims subject to strong (and thus expensive) attorney argument that such claims are invalid "as a matter of law" (*IPXL v. Amazon*) OR unenforceable "as a matter of law" (*NTP v. RIM*). Or vice versa.")

1998), as part of a machine-or-transformation test appropriate to InfoAge and IntellAmp technologies that allows pure-machine-statutory-class claims to InfoAge and IntellAmp technologies without the legal dilemmas of the hybrid claims required by the CAFCIndustrialAge Test.

For at least these reasons, the Court should adopt *In Re Alappat, AT&T v. Excel, and State Street Bank*—but clarified via the newer formal DATA-INFORMATION vocabulary as demonstrated herein—as a Machine-or-Transformation Test appropriate to InfoAge, and, in particular, IntellAmp technologies.

Thus, the Court should either

(a) adopt *In Re Alappat, AT&T v. Excel,* and *State Street Bank*—but clarified via the newer formal DATA-INFORMATION vocabulary as demonstrated herein—as a Machine-or-Transformation Test appropriate to InfoAge, and, in particular, IntellAmp Technologies, OR

(b) require Markman-compliant claim construction in all patent litigations, for at least reasons argued in *Amicus* D. Cook Br. 1-33.

Respectfully submitted,

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January 23, 2014

APPENDIX

APPENDIX A

Bibliography Including Works Cited
or *Works Consulted*

All technical descriptions herein are a synthesis of Amicus based a combination of his working knowledge, consultation with various technical experts, and at least these following works. *As an aid to the Clerks, Amicus has stack ordered the works in case they care to read any of them*:

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See Wikipedia, Instruction Set Architecture, http://en.wikipedia.org/wiki/Instruction_set_architecture ("Instruction set architecture is distinguished from the micro-architecture, which is the set of processor design techniques used to implement the instruction set. Computers with different microarchitectures can share a common instruction set. For example, the Intel Pentium and the AMD Athlon implement nearly identical versions of the x86 instruction set, but have radically different internal designs.")

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See Wikipedia, Field-Programmable Gate Array, http://en.wikipedia.org/wiki/Field-programmable_gate_array

APPENDIX B

THE SUPREME COURT OF THE UNITED STATES

[Filed October 4, 2013]

No. 13-298

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,
Respondents.

On Petition for a Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit

BRIEF OF *AMICUS CURIAE* DALE R. COOK, *PRO SE*, IN SUPPORT OF PETITIONER

Example: IntellAmp Machine-States Must Be Engineered to Create Structured DATA (e.g., Machine-States, such as voltages/ pixel brightnesses)

Appropriate to Both Language (English), and Concepts (Currency Trading) of Expected User of the IntellAmp Automation

* * * *

If viewed from "inside" the machine (e.g., on the inside of an LCD monitor—the part a human can't see), the changes of states of the machine are just that: changes in state (e.g., changes in voltage signals that drive associated brightnesses of pixels on a computer screen). However, when the changes in machine states create a difference a human can perceive, formally "data" (plural of datum) are produced (e.g., the different voltages are such that a human can perceive differences in brightness in at least two areas of the screen). For example, if the changing voltages drove pixel brightness differences creating a character string that an observing human could discern—such as "comprar el dólar canadiense inmediatamente por 90 centavos de dólar en la que tenemos un comprador dispuesto a pagar inmediatamente 95 centavos de dólar"—such a string would constitute data. If a human observer only understands English and not Spanish, such a string would merely constitute data.

However, if data—human-discernible differences (e.g., text string)—are understood to have a meaning by an observing human, such data are said to formally constitute "information." For example, if the data (machines states (e.g., varying voltages/varying pixel brightnesses)) formed the character string "buy the Canadian dollar immediately for 90 cents US in that we have a buyer willing to immediately pay 95 cents US" the data—character string—would constitute information for an English reader.

That character string (data) can be understood by/with human thought, but the data itself does not constitute human thought. From the machine standpoint, it is just the current state of a process that changes pixel brightnesses as dictated by the computer program.

A patent claim to that process would read like the string ("buy the Canadian dollar immediately . . .), but with a proper claim construction, one skilled in the art would understand that what was claimed was the machine-in-motion—process—or an end state of a process that resulted in pixel brightnesses that a viewing human could perceive as the string "buy the Canadian dollar immediately . . . " One skilled in the art would not construe the claim as human thinking because Intelligence Amplification automation, like Alice's, is sold to augment humans, not replace them. Humans are the market to whom Alice sells. Alice does not sell human thinking, but rather a change in machine states/processes, and thus one skilled in the art could never derive human thinking from the claims. That is why this Court's Markman jurisprudence is so critical here.

APPENDIX C

THE SUPREME COURT OF THE UNITED STATES

[Filed October 4, 2013]

No. 13-298

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,
Respondents.

On Petition for a Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit

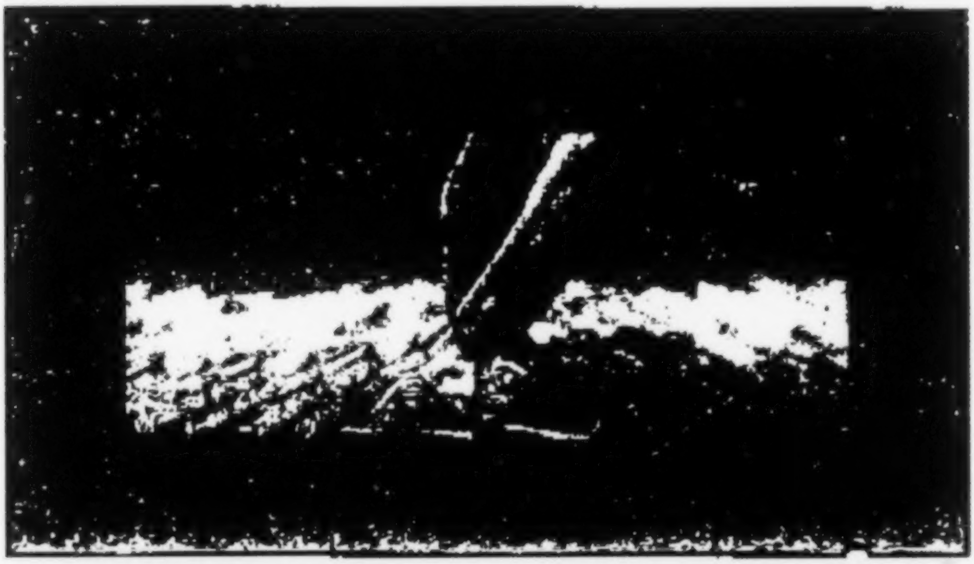
BRIEF OF *AMICUS CURIAE* DALE R. COOK, *PRO SE*, IN SUPPORT OF PETITIONER

Example of Red-Black Dominos Machine-State Transitions/Transformations Causing Tangible (humanly perceivable) Differences, Which Causes Concrete Meaning (human thought or meaning to one who understands English) Which Humans Find Useful

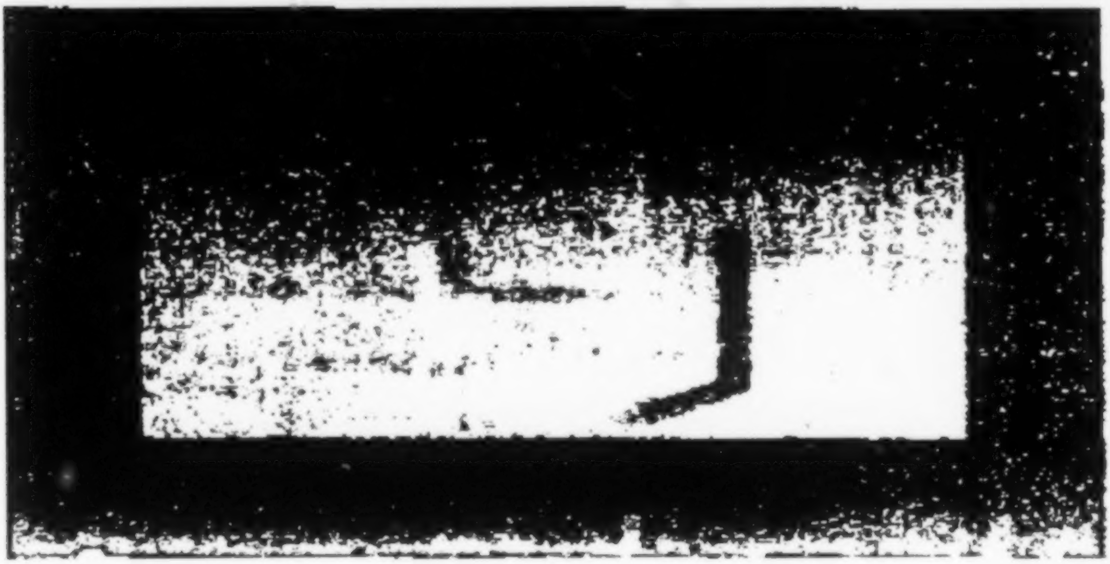
* * * *

Now Amicus presents the emergent process domino analogy in pictures. A computer program for a general purpose processor specifies:

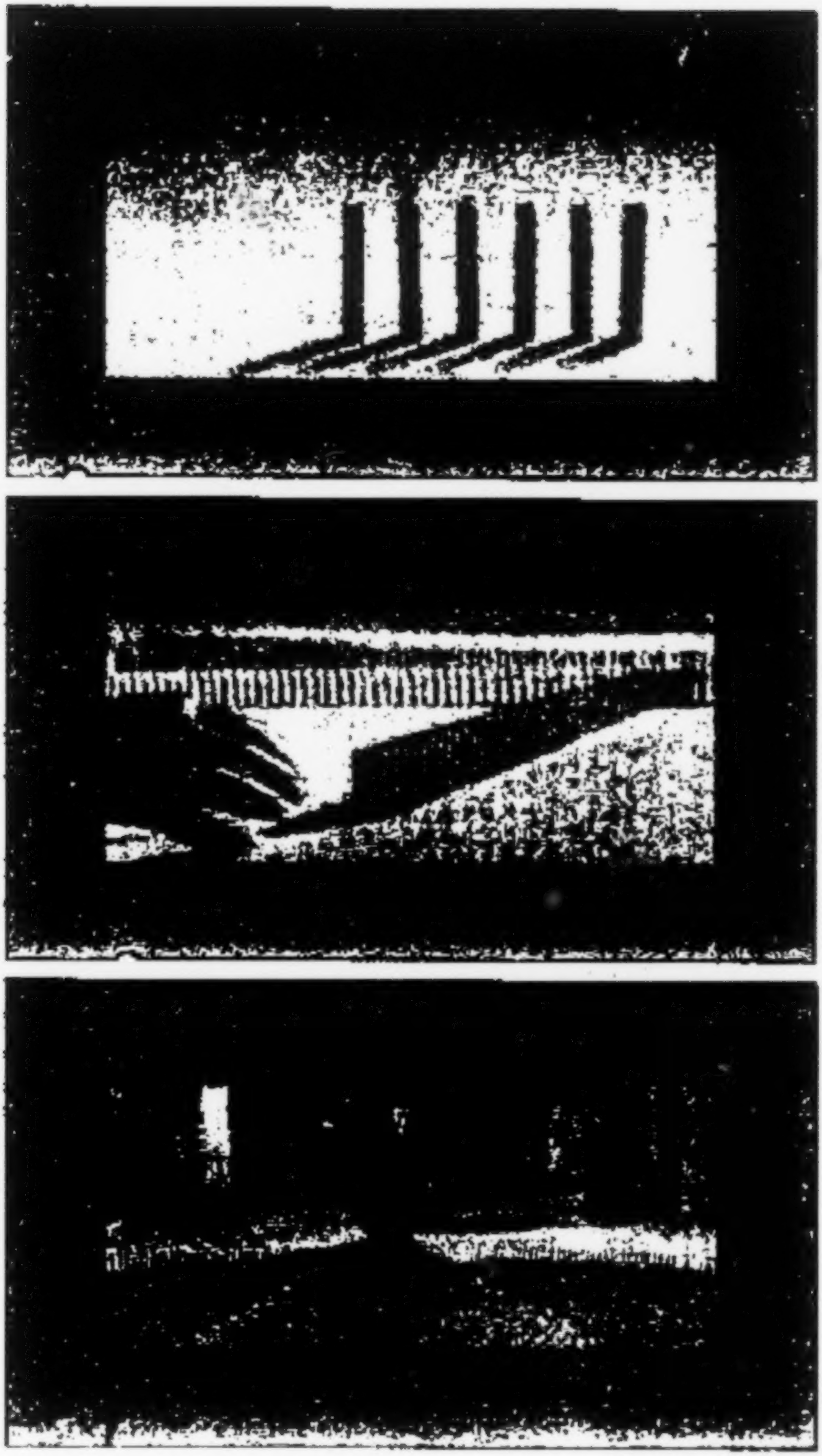
(a) a selection drawn from a collection of many available computing elements in the general purpose processor, analogous to . . . ;



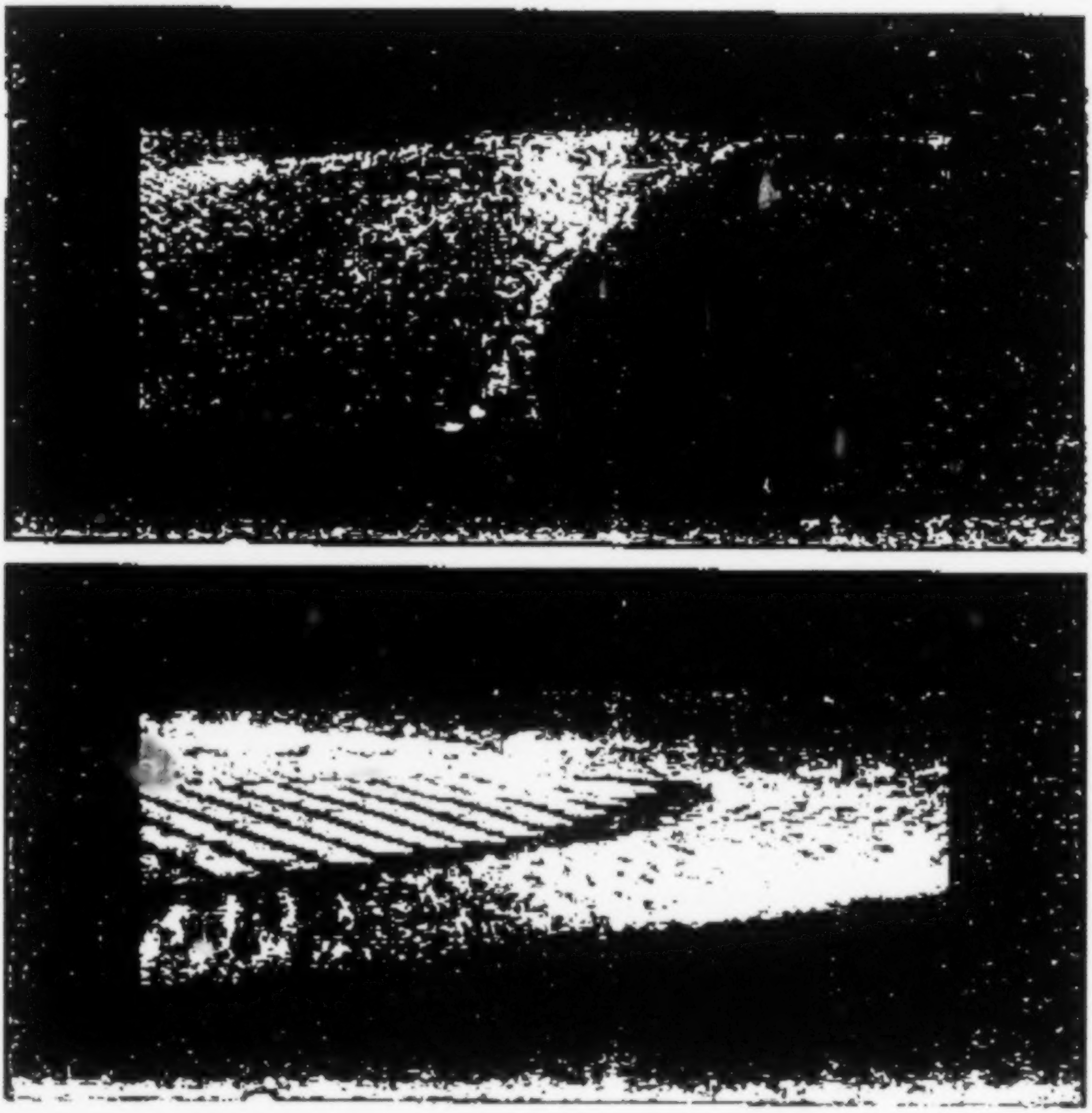
(b) a specification of how the selected computing elements are to be (i) organized (e.g., in sequence or in parallel) to "set up" desired combinational, sequential, and/or parallel logic circuit(s), analogous to … and (ii) such organization further including the sequences and timing of the voltage levels that will be applied to the various selected computing elements in the "set up" circuit(s), analogous to …;



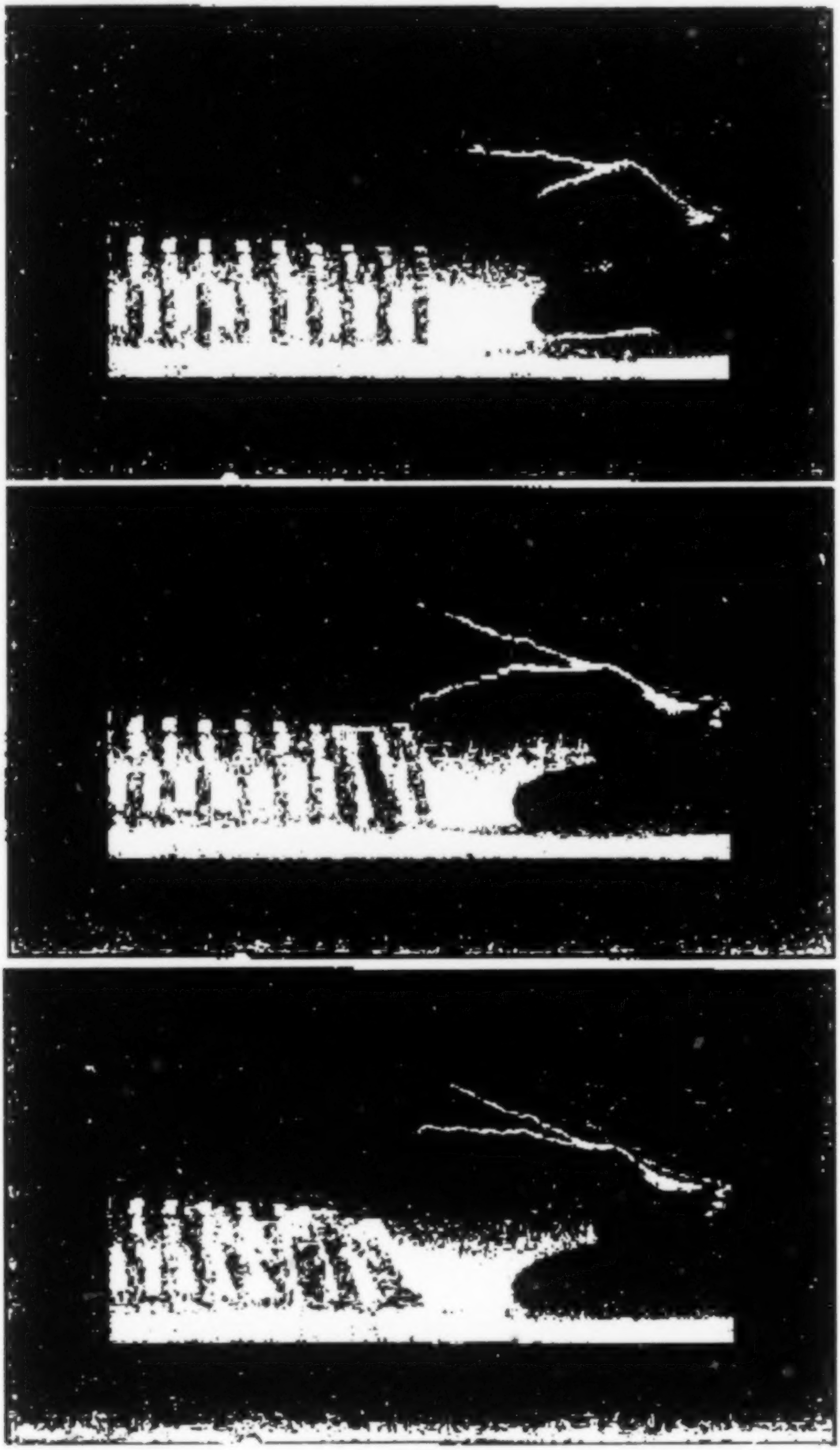
12a



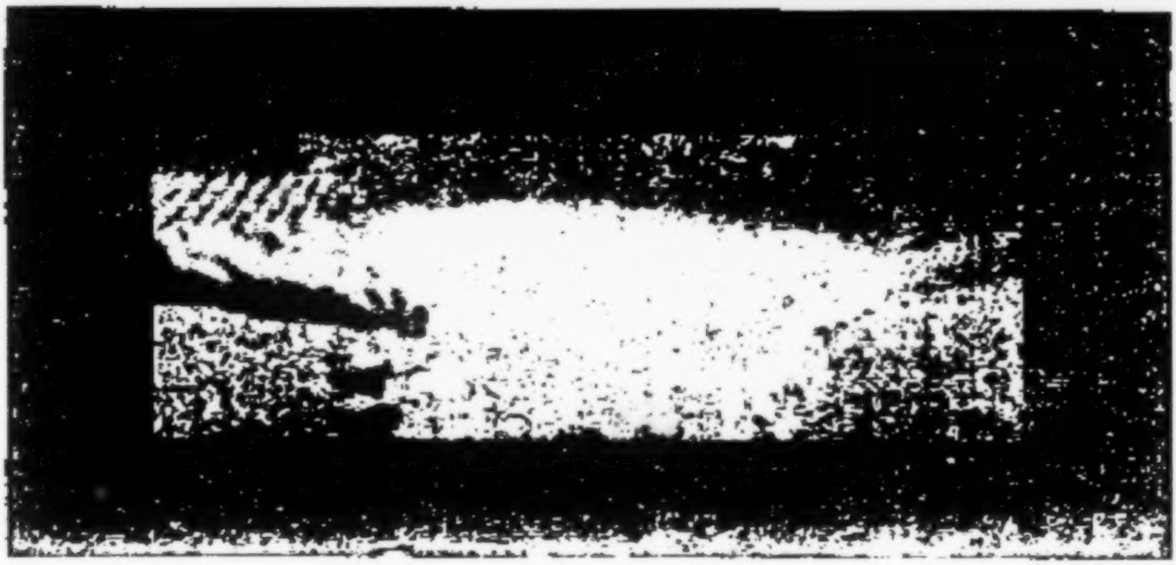
13a

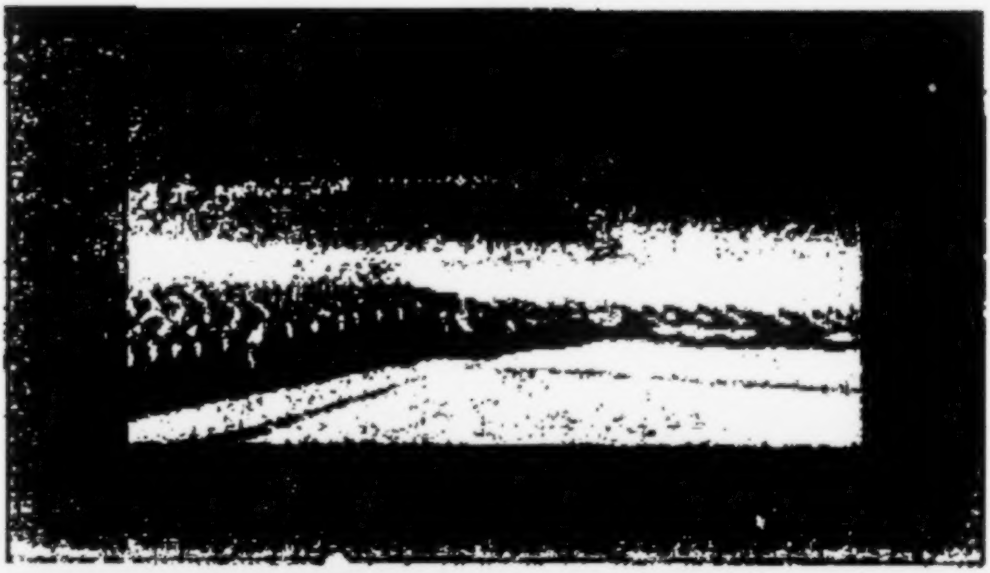


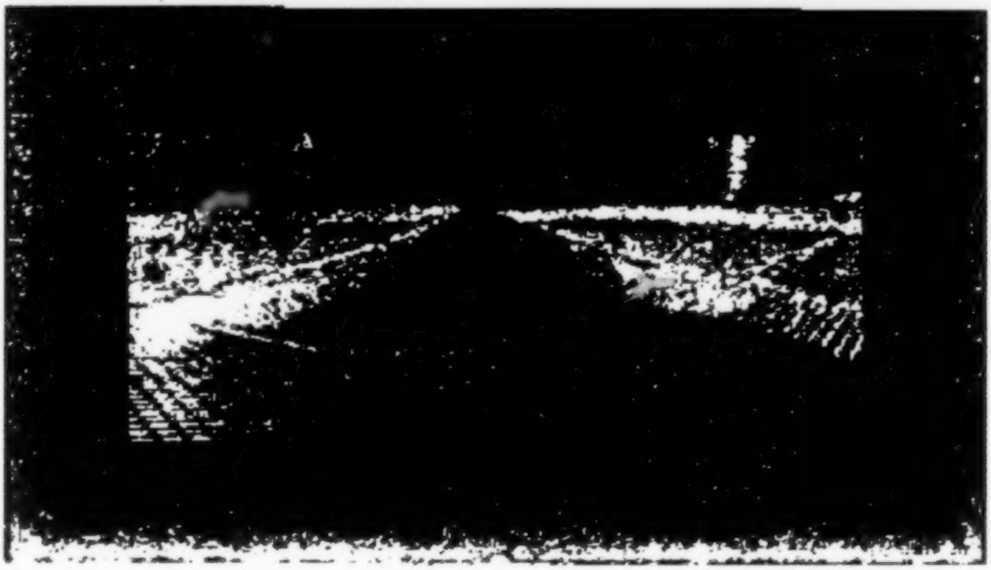
(c) an initiation signal that kicks the logic circuit(s) into action, analogous to ...;



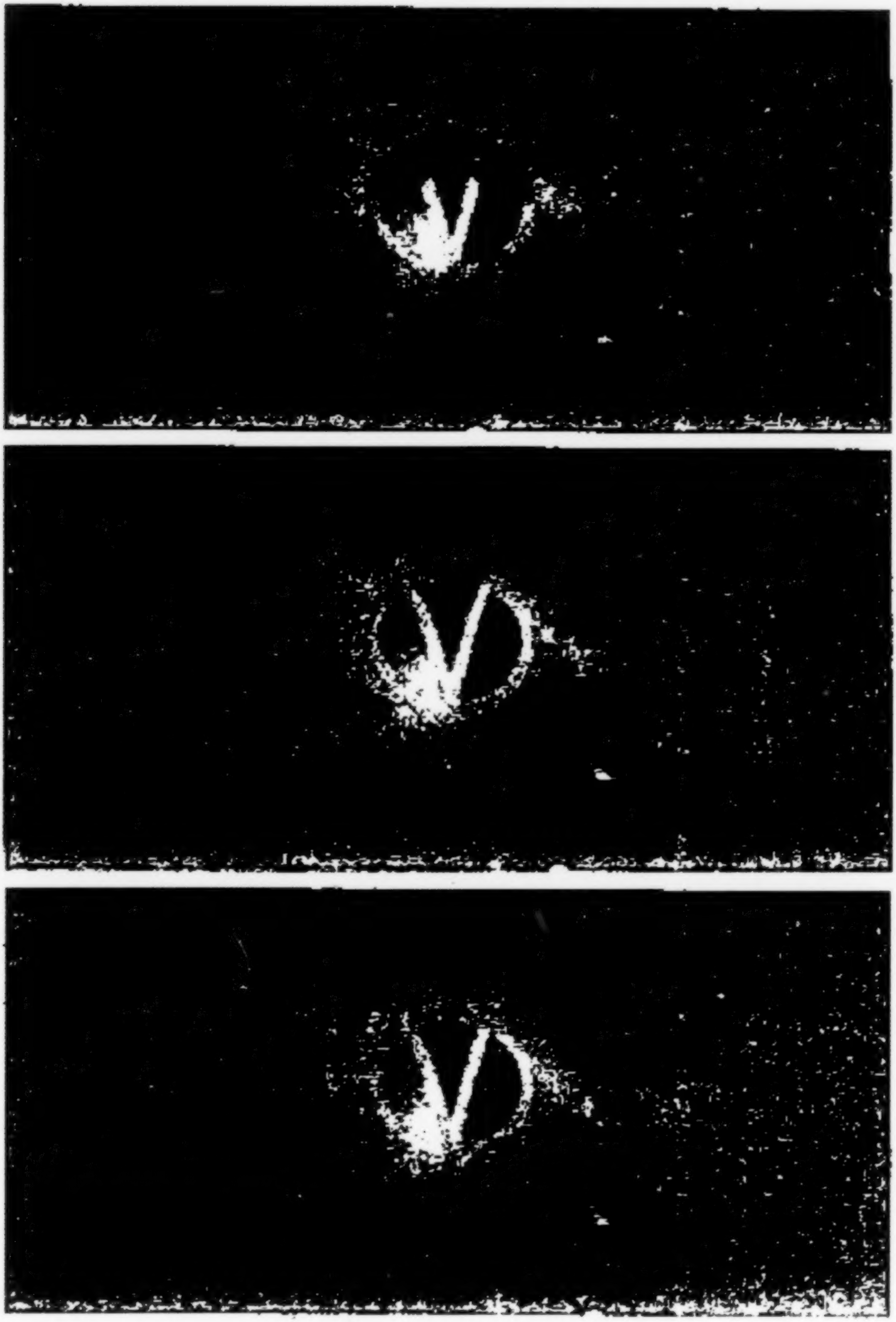
such that (d) after initiation, the states of the various program-selected, program-arranged, and program-timed computing elements as they interoperate in the manner specified by the computer program may be observed/recorded/mapped analogous to ...;







17a



until, (e) ultimately, the flowing pattern/process generated by the interoperating computing circuits gives the result of a set of determined and discrete machine states which manifest a pattern that both (i) can be perceived by and (ii) confers meaning to an observing human, which is analogous to ...:

This mechanical contrivance is analogous to electronic processes-emergent-with-program-assembled-machines-in-operation, but constitutes mechanical processes-emergent-with-program-assembled-machines-in-operation in its own right. But it is not new. There is no need to augur this, as in the judge-created exceptions to otherwise patentable subject matter. Lack of novelty can be objectively demonstrated for the domino message transmission machine and process. Amici urge the Court to vitiate the inscrutable judge-created exceptions to otherwise patentable subject matter in view of criteria that can be demonstrated via objective evidence.

The precision and control of the domino process/pattern that dynamically flowed and was called into being as the dominoes fell into each are anything but

abstract, and result in intermediate/ending states of discrete red-black (binary) dominoes.

The result is a red-black pattern recognized by the viewer as the letter "V" for Specific, an Antonym of Abstract. Amici note that the red-black dominos constitute:

(a) Tangible Perceptions (humanly perceivable differences—formally "data"): something is tangible if it can produce data (plural of datum). Data are one or more differences that can be registered by one or more of the human physical senses (sight, hearing, touch, smell, etc.); the process/result of the process is tangible because it produces a pattern of red-black differences that are perceivable by human vision;

(b) Concrete Meaning (humanly understandable data—formally "information"): information is a difference (data) that makes a difference to someone. Here, the result of the process has concrete meaning in that an English reader can discern the human-semantic letter "V" from the red-black pattern, via a priori known letters of the English alphabet; and

(c) Useful Information (humanly valuable information): the result is valuable in that it allows the Court to understand that Alice's technologies are not anything like what a human does with pen and paper, and are not the human mind itself. The result allows the Court to understand just how far afield the courts have been led in that it provides an analogy demonstrating claimed computational processes are the polar opposite of abstract.

AMICUS
CURIAE
BRIEF

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY LTD.,

Petitioner.

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICUS CURIAE* TONY DUTRA IN SUPPORT OF RESPONDENTS

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QUESTION PRESENTED

Whether claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—are directed to patent eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

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INTEREST OF *AMICUS CURIAE*[1]

The author served for 25 years as a software programmer, manager and executive with a particular expertise in data networking technologies. He received his J.D. subsequent to that experience. He is listed as inventor on seven patents related to Internet telephony and was lead inventor on two of them. Though the patents have not yet expired, they will soon and the author has, in any case, no financial interest in them at this time.

The author is now and has been for almost six years a Legal Editor for Bloomberg BNA's *Patent, Trademark and Copyright Journal*. However, at no time did he solicit advice in preparing this brief from any other employee or manager of the journal's parent company. The brief only reflects author's continuing interest in the efficiency of and balance in the patent ecosystem, and he believes his contribution here can help to serve both. Neither he nor Bloomberg Inc. – to the extent the author is aware – otherwise has any interest in any part to this litigation or stake in the outcome of this case.

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[1] In accordance with Supreme Court Rule 37.6, the author states that this brief was not authored, in whole or in part, by counsel to a party, and that no contribution, monetary or otherwise, to the preparation or submission of this brief was made by any other person or entity. Petitioners and Respondent have consented to the filing of amicus briefs such as this one, and their consents have been filed with the Court.

SUMMARY OF ARGUMENT

The Court in the past has attempted to distinguish abstractness and application with little guidance to practitioners, and the briefing to date in the instant case does not appear to offer a solution. This brief would agree with many others that other sections of the Patent Act can provide alternatives for abstractness, but only in certain limited circumstances. The brief instead, though, offers an alternative, under 35 U.S.C. § 101, that could resolve questions of patent eligibility raised by the patent claims at issue here and many others like them.

A focus on distinguishing useful arts from other-than-useful arts would cover much of the same ground as abstractness and has the benefit of being explicitly rooted in the Intellectual Property Clause of the Constitution and required under Section 101. Though it does not provide a complete answer to the question presented in the petition in this case, it does offer a categorization of computer-related patent claims that simplifies the analysis and gives weight to Section 101 as a threshold test.

A claim for a patent on a method is, by statutory definition, eligible subject matter only as a process. The word "process," by Congressional intent in passing the 1952 Patent Act, replaced but is precisely equivalent to what all prior Patent Acts referred to as an "art." There are many types of arts, and creators in all fields of endeavor are capable of advancements in their specific art fields. But advancements only in the *useful* arts are worthy of a patent grant, per the IP Clause.

Computing is a useful art, and methods claiming advancements in the art of computing should be considered patentable eligible. The method claims at issue in this case, however, do not advance the art of computing. They are advancements in the art of financial contract risk management, which was an art known at the time the Constitution was written and was not then included in any definition of a useful art. Use of advances in other arts – whether employing computers, telephones or carrier pigeons – cannot turn a known other-than-useful art into a useful art. The method claims at issue here, therefore, are not patent eligible processes under Section 101.

System claims construed as machine-based may not necessarily rise and fall with related method claims, but the claims at issue here do. Book printing has always been a useful art, and systems that print books are patent eligible. Systems that print books, upgraded by use of computing resources, are patent eligible to the extent that they use those resources to advance the art of book printing. However, computing resources can be brought to bear, without changing the art of book printing, to implement an author's specific expression, for example, to remove all capitalization in emulation of E.E. Cummings. A system employing such computing resources cannot of itself impart patent eligible because its effect is to advance the patent ineligible literary art. Using the logic processing of a machine to give expression to a literary work does not impart patent eligibility to a claimed system. Similarly, the machine – the computer – employed to advance the art of financial contract risk management here adds nothing to the patent eligibility of the system claims at issue.

A computer-readable medium claim is never patent eligible, and the Court should make that point clear, despite the lack of discussion of these claim types in any of the opinions below. Putting a specific instance of software on a storage medium is equivalent to putting a specific instance of literature – e.g., *War and Peace* – on paper. While advances in printing books (independent of the content of those books) may be patent eligible, using book printing tools to print *War and Peace* does not make *War and Peace* in book form patent eligible.

To be clear, the Court should not read any of the above or below as an argument against software patenting. Indeed, if the Court takes nothing else from this brief, it should be that describing "software" as a single patent type or a single analytical construct is a mistake. Software provides instructions that cause a machine to do something. If the machine following such instructions does something to advance a useful art – whether the art is computing or, in relevant example, curing rubber – the software will make that machine patent eligible and methods and systems related to that advance can be equally patent eligible. If the machine following such instructions does nothing more than advance an other-than-useful art, related method and system claims are not patent ineligible.

ARGUMENT

I. Computer-Implemented Method Claims Can Be Drawn To Patent Eligible Subject Matter But Alice's Claims Are Not.

a. "New And Useful" Requirements Matter, Especially The Latter.

Section 101 allows for the grant of a patent to a claim representing:

> any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof ...[2]

While most other briefs have addressed application of the judicially-created "abstract idea" exception to the four statutory categories of patent eligible subject matter, this paper focuses on the requirements to be "new and useful" and in fact concedes that the patent claims relevant here meet the requirement to be "new." But new-ness is not enough.

An automated piano player is a previously patented device and unequivocally the base machine underlying a useful art.[3] Piano players and rolls processed by the piano player to produce sound enable the playing of instances of musical compositions. Of course, the compositions themselves are without question ineligible for patenting. There is also no evidence of any patent granted for a method of getting a piano player to play *Alexander's Ragtime Band*, or any other musical composition, and no one appears to be making that argument today.

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[2] 35 U.S.C. § 101.

[3] An 1867 U.S. patent was the first of several advancements over the useful art of automated music playing.

For a more recent example, consider a method of playing a digital recording of a movie on some video display. The recording device was once patented and the display was once patented. And the method was once patent eligible as an enabling technology for a new form of entertainment, but can one patent playing *Casablanca* through the same device and display?

In the opinions below and the briefing here, many are making the argument that an instance of software running on a computer is patent eligible because it is either a new machine[4] or a new use of an old machine.[5] But a method directed to a piano player playing *Alexander's Ragtime Band* meets the new-ness requirement in precisely the same way, as does the DVR and video display playing *Casablanca*.

A computing system running an instance of specific software results in a specific sequence of electric charges internal to the computing system.[6] A piano player processing the codes on a specific roll causes specific hammers to hit specific keys. The DVR playing a specific instance of a movie sends specific electric signals to the video monitor, which adjusts the intensity of a specific set of pixels in a specific sequence. A computing system running an instance of specific software, to the extent that the result is different from all previous specific software, is by definition a new use of an old machine. But an *Alexander's Ragtime Band*-playing piano player or a *Casablanca*-playing DVR meets that same definition as well, and neither is patent eligible.

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[4] *See, e.g., CLS Bank International v. Alice Corp. Pty Ltd.*, 717 F.3d 1269, 1302 (Fed. Cir. 2013) (en banc) (Rader, C.J. dissent) ("A special purpose computer, *i.e.*, a new machine, specially designed to implement a process may be sufficient.").

[5] Brief for *Amicus Curiae* Ronald M. Benrey in Support of Neither Party ("Under § 101, a process is eligible subject matter if it is a *new use* of an existing machine, including if that machine is characterized as a 'general purpose computer.'") (hereinafter "Benrey brief").

[6] Brief of *Amicus Curiae* IEEE-USA in Support of Neither Party, p. 9 ("IEEE brief").

Most programmers are taught given an initial task to write a program that displays the text, "Hello World" on a computer screen. At some point, a student entertained his professor by completing the assignment by displaying "Hello New Jersey." Different electric charges are required. Is it a new use of the computer? Yes, but would a claim to that program be drawn to patentable subject matter?[7]

What the opinions below and all but one of the *amicus* briefs to date have failed to do, however, is move to the second requirement of any patent eligibility category, the requirement of usefulness. One *amicus* brief urged the Court to "reinvigorate the Utility Doctrine of § 101," but then asked the Court to construe "useful" according to "its plain meaning, that is, capable of doing something or being used to do something."[8] That, however, is not the definition of "useful" as it is used in the IP Clause and has been used in every version of the Patent Act, including the Patent Act of 1952 that created Section 101.

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[7] Those who argue that an obviousness analysis would bar patentability miss the point. The student here is not engaged in an act of invention. It is at best an act of expression subject to copyright protection.

[8] Brief of Brian R. Galvin as *Amicus Curiae* in Support of Neither Party, pp. 19-20.

The last time this Court addressed the utility doctrine was in 1966 in *Brenner v. Manson*,[9] but it did not therein resolve a dispute about the definition of "useful." The issue in that case was *when* an advance in the art of chemistry was "useful" to prospective users, essentially taking as a given that chemistry was a useful art. The question to be answered in the instant case involves the *character* of use, not whether the public can use what is claimed and disclosed.

A poet can *use* alliteration, metaphor and onomatopoeia to amuse the reader. A composer can *use* various combinations of instruments to entertain an audience. The audience can *use* the entertainment to escape the stress of a hard day at work. But none of those uses can be characterized as being uses "in" the *useful* arts.

b. "Useful Arts" Are Distinguished From "Other-Than-Useful Arts."

Section 100(b) defines "process" as:

> process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.[10]

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[9] *Brenner v. Manson*, 383 U.S. 519 (1966).

[10] 35 U.S.C. § 100(b).

As explained in more detail in at least one *amicus* brief,[11] the Intellectual Property Clause has a parallel construction, with copyright- and patent-related terms interwoven, such that patents are granted "[t]o promote the Progress of ... useful Arts, by securing... for limited Times to ... Inventors the exclusive Right to their ... Discoveries."[12]

As this Court has explained, the 1952 Patent Act's use of the term "process" did not change the standards for patent eligibility because "[i]n the language of the patent law, [a process] is an art."[13] And to be clear, that "art" must be a "useful Art," and not among the class of other-than-useful arts including, for example, the literary art.

This brief has so far identified as other-than-useful arts only those arts amenable to copyright protection. But that is not the extent of other-than-useful arts.

In 1828, Noah Webster defined "art" in a way that clearly distinguishes the use intended in the then-existing Patent Act:

> [A] system of rules, serving to facilitate the performance of certain actions; opposed to *science*, or to speculative principles; as divided into *useful* or *mechanic*, and *liberal* or *polite*. The mechanic arts are those in which the

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[11] Brief for International Association for the Protection of Intellectual Property (Association Internationale Pour La Protection De La Propriete Intellectuelle) in Support of Neither Party, pp. 3-4.

[12] U.S. Const., art I., § 8, cl. 8.

[13] *Diamond v. Diehr*, 450 U.S. 175, 182-84 (1981).

> hands and body are more concerned than the mind; as in making clothes, and utensils. These arts are called *trades*. The liberal or polite arts are those in which the mind or imagination is chiefly concerned; as poetry, music and painting.[14]

Therefore, with regard to patentability specifically, the importance of the word "useful" is to enable patentability for processes and methods, as systems of rules, but only with respect to their contribution to a patentable "trade." A "new and useful art" should then be read to mean either (a) an invented system of new rules applying to an existing trade, or (b) a system of rules specifying a new trade.

Webster further defined a "trade" as being "distinguished from the liberal arts and learned professions, and from agriculture. Thus we speak of the trade of a smith, of a carpenter or mason. But we never say, the trade of a farmer or of a lawyer or physician." An historian in 1952 also contended that arts as applied to trades were distinguished from "the arts of teaching, politics, war, business, and many others."[15]

Two different lists of trades that existed at the time Webster's definition was put forward identified 87 unique trades.[16] Occupations known to be in existence at the time but not on the list (i.e., not recognized trades) include accountant, doctor (or any healthcare worker other than apothecary), politician, soldier, manager, banker and lender.[17]

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[14] Noah Webster, AMERICAN DICTIONARY OF THE ENGLISH LANGUAGE (1828) (available in searchable form at http://webstersdictionary1828.com/) (hereinafter Webster) (emphasis in the original). There were no earlier dictionaries that could tie the definition to the founders' intent more definitively.

[15] Robert I. Coulter, *The Field of the Statutory Useful Arts*, 34 J. Pat. Off. Soc'y 487, 494 (1952).

Usefulness should be construed in light of these explanations of "useful Art" at the time the phrase was created. In general, a way of "doing business" was not considered useful under this construction. Definitions of "doing business" may vary, but definitions of banking are far less controversial, and definitions of financial contract management even less so. One struggles to see that any of them would be considered a useful art at the time. If they were not useful at the time, can they possibly have become useful now?

The remaining question, then, is whether the use of computing systems can turn an other-than-useful art into a useful one.

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[16] THE BOOK OF TRADES; OR, FAMILIAR DESCRIPTIONS OF THE MOST USEFUL TRADES, MANUFACTURES, AND ARTS PRACTISED IN ENGLAND: AND THE MANNER IN WHICH THE WORKMEN PERFORM THEIR VARIOUS EMPLOYMENTS (A. K. Newman 1829), *available at* http://digital.library.wisc.edu/1711.dl/DLDecArts.BkTrades; JACOB JOHNSON, THE BOOK OF TRADES, OR LIBRARY OF THE USEFUL ARTS, PARTS I, II, AND III (Whitehall 1800-1807).

[17] There is no question that there were advancements in at least some of these fields in the eighteenth century. For example, methods for cost accounting were apparently developed throughout this period. *See e.g.*, M. J. Mepham, *The Eighteenth-Century Origins of Cost Accounting*, Abacus 24 (1) (1988).

c. The Court Should Not Challenge A Construction That The Claims At Issue Here Use A Patent Eligible Computing System.

As a threshold concern, the Court should avoid claim construction issues that will only delay providing meaningful jurisprudence on which the computing industry can rely.

First, the Court should take as given that the types of claims the Court must rule on here are construed as requiring the use of a physical computing system. Alice Corp. has no claim for patent infringement against CLS Bank International unless the latter has implemented the claimed methods and systems through a computing system.

Second, the Court should not construe a computing system as a single machine, such that ephemeral communications among components become relevant to the patent eligibility question. A computer is patent eligible as a "virtual" machine, a collection of components that may or may not be encased within the same device. For example, information storage may be internal or external without affecting the patent eligible status of the computer. While references abound in the opinions below and in the briefing to date to a "general purpose computer," it is best to refer simply to a computing system with componentry that is not otherwise patentable in and of itself[18] that is unaltered except insofar as running a specific instance of software causes specific sequences of electrical charges to occur.

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[18] The term "off-the-shelf" can be a surrogate, and interpreted as either covered by an existing patent or in the public domain.

As a consequence of the preceding, the Court should heed the many statements in the briefing claiming a parallel between a particular type of advance in the art of computing enabled through either software or hardware with equivalent results.[19] A computing system is not useful – in any sense, let alone the constitutional sense – unless it is performing an act of processing instructions. Where those instructions are stored within the computing system is irrelevant to patent eligibility. Claims such as those at issue here are directed to processing the logic defined by a software program, and that logic could just as easily be "hard-coded" on "non-reconfigurable hardware" representing one component of the computing system, as placed in purportedly "temporary" random-access memory – another component of the computing system – which, because the best implementation of the system will process that same logic non-stop, is essentially just as permanent.

d. Computing Systems Enable Advances In Arts Both Useful And Other-Than-Useful.

Eliminating these concerns about whether one type of claim recitation should be patent eligible, while another – arguably to the same invention – is not, reduces the determinative question to distinguishing inventions claiming advances where the use of a computing system is a limitation. There are at least four types of claims that can be distinguished as to the art advanced.

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[19] *See, e.g.*, Brief of *Amicus Curiae* Dale R. Cook, pro se, in Support of Petitioner, on the "false dichotomy" of hardware versus software implementation (throughout).

First, there are advances directed to the art of computing itself.[20] That is, one can use the logic processing capabilities of the computing system to advance a computing system's beneficial characteristics. One *amicus* brief identified advances in digital hardware attending to such characteristics as increased speed, lowered costs, greater miniaturization and/or lower power consumption.[21] But as noted above, software implementations may be equally effective in making such advances. Specific instances of a computing system running specific logic can increase speed and lower power consumption, at least, and one can imagine lowered-cost arguments as well. In addition, advances in the art of computing can be in the addition of capabilities that prior computing systems could not offer to computer programmers. That is, if the persons of skill in the art of computing comprise both hardware and software engineers, tools that make those persons more capable should be patent eligible as well. It is not unusual in the least for such tools to be enabled by a general computing system running newly created software.[22] Thus, claims directed to advances in the art of computing itself meet the requirement of usefulness.

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[20] Of course, computing was not a recognizable trade in the eighteenth century. This brief assumes that there is no doubt that computing became a useful art at some point. The question of when the patent system should declare a new art to be added to the list of useful arts is not at issue in this case. However, the definitions provided in Section I.b supra offer a reasonable framework should the Court face such a question in the future.

[21] IEEE-USA brief, pp. 15-17.

[22] On its face, the invention at issue in *Gottschalk v. Benson*, 409 U.S. 63 (1972), was directed to an enabling capability of computing systems that did not previously exist. That suggests that the case was at least improperly decided under the argument herein, but see note 30 below for an alternative view.

Second, the art of computing created other arts that did not exist prior to and would not exist without computing, what may be called computer ancillary arts. The field of robotics clearly encompasses special versions of computing systems and so is an easy example of a computer ancillary art. An advance in robotics by implementing specific logic processing is useful. Difficult questions arise in other computer ancillary arts in other fields, though, such as the field of artificial intelligence. Such AI applications as expert systems, facial recognition and natural language translation essentially seek results to match long recognized other-than-useful (i.e., mental) actions that humans do all the time. While this case does not present such difficult questions,[23] one can differentiate the AI applications as computer ancillary arts on one of two grounds. First, they may be intended to add capabilities to the machines on which they are processed. Humans do not need help in facial recognition; machines searching a crowd for a particular person do. Second, they typically are claimed as enabling technology versus instances of use.[24] For example, the first inventor of a "rules engine" enabling the development of expert systems created a computer ancillary art that was meant to replicate but not necessarily mimic humans' thought processes when diagnosing a problem.[25]

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[23] *See* Benrey brief for a disavowal of the "legal principle that a general purpose computer operating under program control to execute a given calculation performs essentially the same mental steps that a human would," as argued to be established in *Benson*. That disavowal should carry over to the field of artificial intelligence, which is not based on mimicking human thought but rather making judgments that a human would make. The Federal Circuit recently addressed such an invention in ***Smartgene, Inc. v. Advanced Biological Labs., SA***, and, under this brief's standards, made the mistake of making the parallel to human thought.

The claims at issue here, however, are not directed to the art of computing itself. The speed, cost, size and power characteristics of the computing system are not affected by processing the logic claimed here, nor are any new tools provided to persons of skill in the art of computing. These claims are instances of use of a general computing system processing specific logic directed to another art. The claims are also not directed to arts ancillary to computing. They do not enable transactions that do not already take place; they take transactions that already take place and improve them. If these claims are advances in another art, the next question is whether that art is useful or not.

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[24] The author is wary that labels such as "enabling" and "instance' may more closely track jargon than law. Alternative constructions are distinctions of "form" or "structure" compared to "content" or "substance." However, it must be noted that the distinction between "abstract" and "application" confuses the programming community, since *all* software programs are applications of one type or another.

[25] *Smartgene* presents another difficult question not at issue here: If the first expert system was enabled as an auto mechanic's expert system, how does one analyze a subsequent instance, as in that case, of a medical expert system? Since that is a question of an invention of an instance within a useful art, it would seem that Section 101 is met but that obviousness concerns, under 35 U.S.C. § 103, arise: Was the rules engine unaltered or did it have to be improved to deal with medical knowledge? Are the parallels between auto problem diagnosis and medical diagnosis so similar that an expert system designer – the person of skill in *this* art, not the doctor – would use the same construct but only with different content?

To be clear, even claims not directed to the art of computing itself can be directed to another useful art. This Court held in *Diamond v. Diehr* that a computer-implemented invention directed to the art of curing rubber was patent eligible.[26] Thus, the third distinguished type of claim to use of a computing system is the more typical example of a new use of an old machine, where the new use is in a separate art and that art is useful.

The fourth type of claim is then obviously one directed to another art that is an other-than-useful art. Logic processing that searches a dictionary of words to suggest alternatives for alliteration might enable more pleasing poetry, but it is not *useful*. Logic processing that allows a user to fill in tax return information is, for many, of great use compared to manually completing Form 1040, but that it is not a *useful* use per the statutory requirement.

e. Alice's Method Claims Are Directed To An Other-Than-Useful Art.

Representative Claim 33 of U.S. Patent No. 5,970,479 is drawn to: "A method of exchanging obligations as between parties ...." By its preamble, the claim is disclosing to the world the art it claims to advance.

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[26] *Diehr*, 450 U.S. 175. Curing rubber – vulcanization – was a later-than-eighteenth-century invention and so had to become recognized as a useful art at some point. Again, this brief makes no specific argument on how the Court should address the issue presented when a patentee or patent applicant claims to have invented a new useful art, but it also does not doubt that vulcanization is one such art.

As stated previously, claim drafting should not determine this case, but additional intrinsic evidence of the art advance is apparent. The abstract identifies "[m]ethods and apparatus which deal with the management of risk." Further, the Patent and Trademark Office's assigned class 705 is titled "Data Processing: Financial, Business Practice, Management, or Cost/Price Determination, and defined as

> ... the generic class for apparatus and corresponding methods for performing data processing operations, in which there is a significant change in the data or for performing calculation operations wherein the apparatus or method is uniquely designed for or utilized in the practice, administration, or management of an enterprise, or in the processing of financial data.

All aspects of the USPTO's definition beg the question presented here, but they make clear that the relevant arts are either "the practice, administration, or management of an enterprise" or "the processing of financial data." The former were specifically excluded from the useful arts in 1790. The latter does not help as a basis for establishing patent eligibility. All computing systems process data. Why would "financial data" reserve a special dispensation?[27]

At their broadest, Alice's method claims are directed to the art of banking, which by all indications appears to have been excluded from the original definition of "useful arts." Narrowing them to "escrow accounts," "intermediated settlement" or any other subset of devices used by banking (or insurance, for that matter) interests does not serve Alice's argument any better.

To be sure, prior "advances" in other technologies improved the art of financial contract management risk, and there is no evidence of any patent being granted for prior developments. The invention of the telephone undoubtedly decreased the risk for contract default by allowing the intermediary to conduct business by communicating with the parties over long distances. Telegraph, telex and facsimile offered additional advantages in their time. Computerization differs from those prior technologies only in further removing a human's effort, and one potential for error (though adding potential for a different kind of error), from the transaction. If that is the basis for turning an other-than-useful art into a useful art, then mathematics is now a useful art. That cannot be a reasonable conclusion under the plain language of the IP Clause.

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[27] The author acknowledges the argument that financial data, in fact, do deserve special consideration, such as in Brief of *Amicus Curiae* Regulatory Datacorp, Inc. in support of Neither Party in *In re Bilski*, No. 2007-1130 (Fed. Cir. April 7, 2008) ("Economists themselves now view their field as constituting a 'mathematical science' with closer affinity to physics and engineering than to liberal arts like English literature."). Of course, *some* banking community stakeholders such as Alice Corp. would want banking added to the list of useful arts in the same way *some* economists might want financial data added to that list. The interests of some participants in an other-than-useful art, when other interests in the same field – CLS and, presumably, other amici supporting its position – believe the opposite, should be resolved in Congress, if at all.

The method claims at issue here use a computing system to make an advance in an other-than-useful art. They are not patent eligible under Section 101.

II. System Claims Are Patent Eligible When Dedicated To Operation In A Useful Art, Which Alice's Claims Are Not.

a. A System Claim Cannot Become Patent Eligible By Using A Useful Machine With An Other-Than-Useful Effect.

A washboard is (or at least at one point was) a useful device for cleaning laundry and a jug is a useful device for containing liquids. Spoons are useful for eating soup. Did the first jug band deserve a patent for using the washboard, jug or spoons to make music?

The patent community could have avoided the snarky question posed by the uninitiated of how the Patent and Trademark Office could have granted a patent on using a laser pointer to exercise a cat[28] by simply acknowledging that one cannot receive a patent on an existing machine – or article of manufacture – for a new use in the other-than-useful arts.

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[28] U.S. Patent No. 5,443,036.

b. System And Method Claims Rise And Fall Together Under The Circumstance Where The Only Change To The System Is In The Logic Processed.

But one can imagine a modification to a washboard, jug or spoons that makes them useful only for playing music and not for their established (previously patented or in the prior art) uses. It is conceivable that such an inventor could make a claim for patent eligibility of such an advance in musical instruments, but again that is not at issue here.

Circumstances under which a system claim will be patent eligible and a method claim not patent eligible may exist, but as applied to the use of computing resources, we must again consider whether the logic processing of a specific instance of computing resources is such an example.

Claim 26 of Alice's U.S. Patent No. 7,725,375 patent claims, "A data processing system to enable the exchange of an obligation between parties ...." Clearly, it is a claim to a generic computing system implementing the method that was determined to be patent ineligible.

Proponents of the patent eligibility of any claim using new software logic use the interchangeability of software and hardware as a justification, but as noted above, that simply "moves" the question from one component of the computing system to another. Thus, the argument cuts both ways. If the logic is directed to an advance in an other-than-useful art, the fact that hardware is part of the logic processing does not change the patent eligibility question. A computing system unaltered except insofar as running a specific instance of software is no different from a washboard, a jug or spoons.

In such circumstances, the two types of claims will either rise together or fall together. The circumstance exists here; Alice's system claims fall as their method claims did.

III. Usefulness And Abstractness Cover Much Of The Same Ground.

The Court cannot help but be cognizant of the frustration expressed in the opinions below and in the briefing with a standard based on defining the "abstract idea" exception to the statutory category of patents for processes. The standard requires a distinction between an idea and an application of that idea, and the dividing line is without question elusive if not impossible.

But as noted above, Webster distinguished other-than-useful arts as "those in which the mind or imagination is chiefly concerned," which comes reasonably close to the concern over prohibiting patents on an abstract idea. Further reliance on the definitional distinctions between useful and other-than-useful arts, then, can at the very least provide a more workable standard, if not as a complete replacement then at least as a surrogate in specific circumstances: If an invention today is claiming an advance in an art that is other-than-useful, it is not patent eligible as an art (method), and if it is implemented through an unaltered computing system, is not patent eligible as a machine.

There may be instances where a patent claim is directed to a useful art but the Court still wishes to invoke the abstract idea exception. The question of when a new art proposes to be added to the list of useful arts presents one such case: The inventor may have invented something that should be added to the list but must be careful not to claim the invention as an idea as opposed to its application.[29] Within a useful art, an advance may be claimed so broadly as to be directed to an abstract idea as well.[30]

However, with the claims here making an advance in an other-than-useful art, neither circumstance is presented.

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[29] *See, e.g.*, the Court's decision that claim 8 at issue in *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1853), also known as *The Telegraph Patent Case*, was not patent eligible while other claims of the patent were. Though the 1952 Patent Act may have moved this question to one of enablement under 35 U.S.C. § 112(a), this brief makes no argument either way.

[30] *Benson* conceivably rests on this argument. *See, e.g.*, Brief of *Amici Curiae* Professor Lee Hollaar and Peter K. Trzyna In Support Of Neither Party, pp. 18-21 (disputing whether Benson was claiming a computing system operation at all). This brief makes no judgment on that argument but offers an alternative example. Programmers use a programming language to represent the required logic and a new programming language would conceivably represent a useful tool. Abstractness may be invoked to prevent a patent claim to the structure of the language itself while allowing patent eligibility to a claim to a compiler used to translate code written in that language into object code.

There is thus no need for the Court to resort to a distinction based on abstraction here. Should the Court conclude that the claims here are more closely associated with ideas and the mental aspects of business transactions than practical applications, the useful art categorization of computer-related patent claims offers a brighter line and recognizes the same distinction.

IV. Putting Software On A Computer-Readable Medium Is Never Patent Eligible.

The third type of claim at issue in this case is the so-called *Beauregard* claim. In *In re Beauregard*, the Federal Circuit held that a computer program was patent eligible subject matter when claimed in terms of an article of manufacture as contained on a computer-readable medium (CRM) such as a floppy disk.[31] In the context of the discussion above, this would at first glance appear to be eligible or ineligible for patenting along the same analysis – whether the computer program in question is dedicated to a useful art or not. But that distinction is not necessary for CRM-based claims.

The logic-processing distinction noted above is irrelevant to the CRM claim because the claim does not involve processing. The program that resides on the CRM – whether in source, object or executable form – is not useful until it is processed by a computing system. Prior to that point, it is an instance of logic and no different from an instance of music on a compact disk or an instance of a movie on digital video disk. The CD and DVD are protectable under copyright law. Software on a CRM should, at best, be protectable under copyright as well.

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[31] *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995).

It must be noted that compact disk player cleaning kits are available that include a CD whose purpose is useful – directed to maintaining the CD player. Such a cleaning kit would be patent eligible as directed to improving the performance of the player. It thus may be argued that a computer program on a CRM that is directed to computing-art advancements should be treated equally.

However, the cleaning kit is not an instance of music, and it does not clean the CD player by processing an instance of music. It "processes" a liquid that cleans the CD player lens. Its usefulness is not driven by content that is arguably not patent eligible.

CONCLUSION

Use of a generic computing system to process an instance of logic – as encoded by a software program – may be eligible for patenting under 35 U.S.C. § 101 in three circumstances: When the logic advances the art of computing, when it is directed to an ancillary art of computing or when it is directed to an advance in a useful art. The software programming community is capable of significant advances in all these areas, and such advances are the kind the IP Clause was meant to encourage. Programmers responsible for such advances should thus be rewarded with grants of patents where appropriate.

However, the claims at issue here use a generic computing system to process an instance of logic directed to an advance in an other-than-useful art. Other-than-useful arts can be identified by the distinction made between the two at the time the IP Clause was created and for which there is no evidence of a change in 220 years.

There are difficult questions to address as to identifying when a previously unknown advance can be said to be a new useful art, and whether a specific art can be identified as ancillary to the art of computing or merely a computational replacement for human thought, but the instant case presents none of those difficult questions.

The Court should hold that all claims at issue in this case do not meet the usefulness requirement of Section 101.

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AMICUS
CURIAE
BRIEF

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Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICUS CURIAE* ELECTRONIC FRONTIER FOUNDATION IN SUPPORT OF RESPONDENTS

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INTEREST OF AMICUS CURIAE[1]

The Electronic Frontier Foundation ("EFF") is a nonprofit civil liberties organization that has worked for more than 20 years to protect consumer interests, innovation, and free expression in the digital world. EFF and its more than 29,000 dues-paying members have a strong interest in helping the courts and policy-makers in striking the appropriate balance between intellectual property and the public interest. As part of its mission, EFF has often served as amicus in key patent cases, including *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238 (2011); *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); *Quanta Computer, Inc. v. LG Electronics Inc.*, 553 U.S. 617 (2008); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007); and *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006).

INTRODUCTION AND SUMMARY OF ARGUMENT

This Court has repeatedly made clear that 35 U.S.C. § 101 should serve to define what inventions make up patentable subject matter; in so doing, it has corrected the Federal Circuit's erroneously expansive interpretation of that section. Despite the Court's clear guidance in recent cases, the Federal Circuit has failed to implement a workable standard—or, frankly, any standard at all—as to what computer- and Internet-implemented inventions are patentable. The resulting legal instability has driven up the already-ballooning costs of patent litigation and has discouraged district courts from using §101 to slow that trend.

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[1] No counsel for a party authored this brief in whole or in part, and no such counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than the amicus curiae, or its counsel, made a monetary contribution intended to fund its preparation or submission. Letters of the Parties' general consent to the filing of amicus briefs are on file with the Court. Web sites cited in this brief were last visited on February 21, 2014.

The Court should use this opportunity to do what it has already done in other technological areas[2]—clearly state that § 101 serves as a meaningful tool to reign in overbroad software patents. These patents must be dealt with: they threaten the public interest by throttling the freedom to create, they discourage young innovators from increased innovation, and, consequently, they tie up important downstream inventions. Software now forms one of the largest industries in the United States, yet no proof exists that the advent of software patents in the mid-1990s had anything to do with its growth. In fact, the data show the opposite: the industry maintained a growth rate before 1994 that it continued to see after the Federal Circuit devised the notion of broad software patents that year. Software patents, if anything, have hurt the industry.

The growth of this industry has brought about many life-changing innovations, some of which are summarized below. One of particular importance is that it has endowed anyone with access to a computer the power to code, and, thus, create. It has lowered the barrier to entry in new and fundamentally important ways, opening doors for individuals from all walks of life to create and disseminate software-type inventions. These innovators should have the freedom to write software code unobstructed by patents on abstract methods and systems, such as those claimed by Alice Corp. here.

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[2] See *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013); *Mayo Collaborative Services v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012).

This Court recognized the inherent challenges that come with this shift in *Bilski v. Kappos* nearly four years ago: "With ever more people trying to innovate and thus seeking patent protection for their inventions, the patent law faces a great challenge in striking the balance between protecting inventors and not granting monopolies over procedures that others would discover by independent, creative applications of general principles." 130 S. Ct. 3218, 3228 (2010). At that time, the Court declined to definitively resolve that challenge. Respectfully, the time has come. The current failure of § 101 to reign in overbroad software patents hurts the software industry, stifles innovation, and harms the public interest.

ARGUMENT

I. Limits on the Patentability of Software Innovations Will More Likely Help than Harm the U.S. Software Industry

Alice and its amici suggest that the software industry will suffer enormous harm if the Court does not broadly uphold the patent eligibility of computer software. *See* Alice's Opening Brief at 55 (stating that a ruling adverse to Alice "will decimate entire sectors of the economy and stifle innovation"). The Federal Circuit's former Chief Judge advises that software patents are "essential" and that weakening software patents will supposedly "cripple, if not destroy, computer-related industries . . . which are vital to the future of the country." Brief of Paul R. Michel at 1, 9. We are told that the "consequences of a failure to preserve the patent-eligibility of software-implemented solutions are numerous and harmful to our country." Brief of IEEE-USA at 26-28. The Court is warned "not to erect barriers to the patentability" of computer-implemented technologies (Brief of Intellectual Property Owners Association at 2), since doing so would cause "vital and important inventions to be lost" (Brief of Conejo Valley Bar Ass'n at 4).

Alice and its amici are wrong. The Court need not be concerned that a decision expanding the effect of § 101 might adversely affect the computer software industry. Software patents do not promote innovation in the computer software industry—in fact, the recent flood of such patents impedes innovation.

Significantly, Alice and its amici do not analyze or discuss whether there is any causal connection between widespread software patenting, on the one hand, and innovation and growth of the software industry, on the other. If there was any causal connection, one would expect minimal software growth before software patents became available, followed by a booming industry when patents became freely available. But no such thing happened: software patents simply don't cause more software innovation, since this field doesn't rely on patents to spur innovation. A decision that broadly and clearly enforces § 101, and that has the effect of limiting the number of software patents, will thus be greatly beneficial to the industry, its innovators, and its users.

A. The U.S. Software Industry Experienced Phenomenal Growth In Its First Four Decades Before the Advent of Software Patents

1. The Software Industry Was Highly Innovative Well Before 1994

Assuming that there is some actual causal relationship between the grant of large numbers of software patents, on the one hand, and software innovation, on the other—as Alice and its amici argue—then one would expect that the software market would show a similarly large increase after the 1994 time frame, when the PTO started granting software patents in earnest. *Infra* at Section I.B.3.b. But no such causation exists, because the software industry was highly innovative before that time. *See* Martin Campbell-Kelly, *From Airline Reservations to Sonic the Hedgehog: A History of the Software Industry* Fig. 1.2 at 16 (I. Bernard Cohen & William Aspray eds., 2003) ("Campbell-Kelly"), which shows how the software market rapidly increased well before 1994:

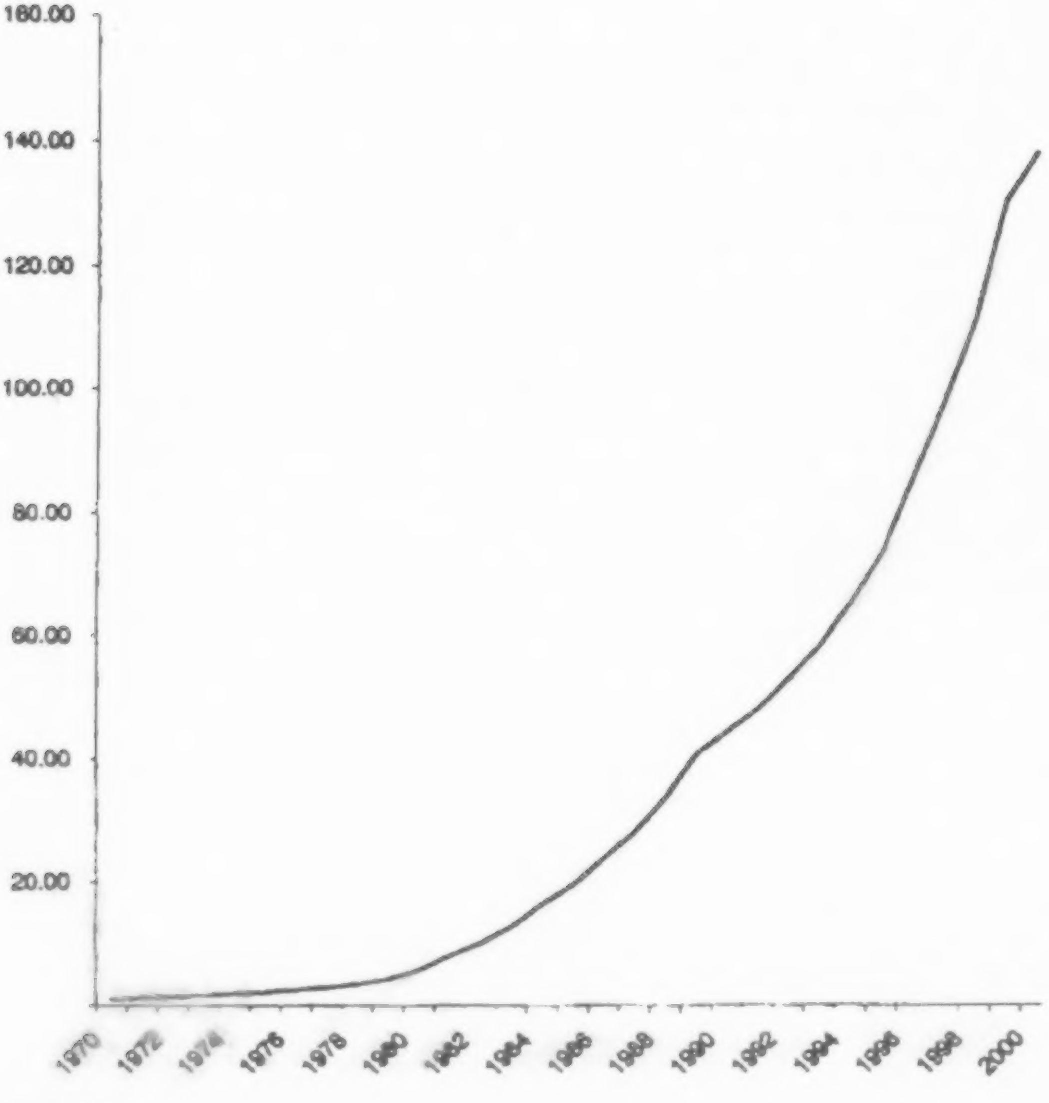

Figure 1.2
The total US software market (user expenditures in billions of dollars), 1970–2000. Courtesy of INPUT.

The software market began its rapid increase in the early 1980s— around the time personal computers became widespread—more a decade *before* the Federal Circuit concocted widespread software patents in 1994. *See In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994); *infra* at Section

I.B.3.(b). Obviously, no patents were needed for software to become a $60 billion/year industry by 1994. Moreover, if software patenting caused software innovation, one would have expected a sharp increase in the market after 1994—an increase that tracked the corresponding increase in software patents[3]—but that, too, didn't happen. The industry merely continued its steady climb that began well before any significant software patenting was available.

2. Software Innovations—and the Software Industry—Continued Apace Without Patent Protection

From the 1950s through the mid-1990s, the U.S. software industry grew from a nascent data processing and services business to a broad-based industry with annual revenues in the many tens of billions. Campbell-Kelly, *supra*, at 16-19, 29. The industry did so without the benefit of software patents, as shown by the following examples.

- *Mainframe computers*. The computer industry started in the 1950s with mainframe computers (largely made by IBM) and accompanying software. This included fundamental programming languages such as FORTRAN and COBOL, and key applications such as the IBM-American Airlines SABRE airline reservation system. *Id.* at 29-54.

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[3] As discussed more fully, *infra* at Section I.B.3.(b)., the annual grants of software patents began increasing in 1994; that increase began a more sustained spike beginning in 1997.

- *Expansion in the 1960s and 1970s.* Much of the software produced in the 1950s and 1960s came bundled with computer hardware, although a services industry emerged (e.g., to provide system integration and customization). Also, ambitious application programs in the banking, airline, aerospace, and military contracting industries became economically significant. *Id.* at 57-87. The 1970s saw a substantial expansion of the software industry after the U.S. Antitrust Division persuaded IBM Corp. to "unbundle" software it had provided to its popular mainframe computers. *Id.* at 114-18. Product lines expanded to include communications, engineering, financial, retail, and transportation industries. *Id.* at 136-41. The UNIX operating system began in the early 1970s. *Id.* at 143-45.

- *Database and office automation software.* IBM and others developed database systems starting around 1964, while Wang Laboratories and others introduced office automation software in the early 1970s. Database developer Oracle Corp. grew from $13 million in revenue in 1984 to $2 billion in revenue by 1994. *Id.* at 145-49, 159-61, 185-91.

- *Personal Computers.* Even more significant in the rise of the U.S. software industry in the 1980s was the introduction of the IBM PC and the development of "killer apps" such as Lotus 1-2-3 which drove demand for PCs. The era developed innovative products such as the MS-DOS and CP/M operating systems, the BASIC programming language, and applications such as the Lotus and other spreadsheets, word processors, and database programs. *Id.* at 201-28, 252-57. While the industry as a whole grew rapidly between 1980 and 1995, *id.* at 16 (Fig. 1.2), some firms experienced phenomenal revenue growth. For example:

  - Computer Associates' annual revenues were $18 million in 1980, then grew to over $2 billion by 1994 and $3.5 billion by 1996. *Id.* at 178-85.

  - IBM's software revenues grew from $800 million in 1980 to almost $13 billion by 1995. *Id.* at 175.

  - Microsoft grew from $8 million in revenue in 1980 to more than $4 billion in 1994. *Id.* at 233. (Indeed, by 1994 Microsoft was able to attain monopoly power in the market for operating systems. *See* section I.B.2. below.)

- *Graphical User Interfaces.* A major, pre-1994 innovative development (still in universal use today) was the graphical user interface for computers. This work started in the 1970s at Xerox's Palo Alto Research Center, followed by Apple Computer's Lisa and Macintosh products in 1983-84, and then Microsoft Windows in 1985. *Id.* at 246-251.

- *Video games and recreational software.* By 1994, a multi-billion-dollar industry had been developed by companies such as Atari, Activision, Tandy, Broderbund, Nintendo, Sega and others, for video games such as Pong, Space Invaders, Mario Bros., Tetris, the unforgettable Sonic the Hedgehog, and others. *Id.* at 269-288.

- *Computer networks and the World Wide Web.* The Internet Protocol, used by the modern Internet, was invented around 1981.[4] Tim Berners-Lee invented the HTTP protocol used for the World Wide Web in 1990;[5] the Web became popularized after Netscape released the first commercial browser in 1994.[6] AOL and other companies popularized the use of home computers online starting in 1985.[7]

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[4] RFC 791, *Internet Protocol*, DARPA Internet Program Protocol Specification (September 1981), available at: http://www.ietf.org/rfc/rfc791.txt.

[5] RFC 1945, Hypertext Transfer Protocol/HTTP/1.0 (May 1996), available at: http://www.isi.edu/in-notes/rfc1945.txt.

[6] Adam Lashinsky, *Remembering Netscape: The Birth Of The Web*, CNN Money (July 25, 2005), available at: http://money.cnn.com/magazines/fortune/fortune_archive/2005/07/25/8266639/.

[7] *25 years of AOL: A timeline*, Washington Post (May 23, 2010), available at: http://www.washingtonpost.com/wp-dyn/content/article/2010/05/23/AR2010052303551.html.

B. The Modern U.S. Software Industry Largely Does Not Rely on Protection from Software Patents to Grow its Core Business

1. Empirical Evidence Shows that Software Patents Do Not Play an Important Role for Most Software Firms

According to the Business Software Alliance, the U.S. software industry today "adds more than $260 billion in value to the U.S. economy." Business Software Alliance, *Software Industry Facts and Figures*.[8] The software industry has thus grown to be an even more significant contributor to the gross national product and to U.S. export markets than in the 1990s. It is, therefore, very telling that several empirical studies report that only a small minority of software development firms seek patent protection for their innovations. Robert M. Hunt & James Bessen, *The Software Patent Experiment*, Fed. Reserve Bank of Phila. Bus. Rev., Q3 2004 at 24;[9] James Bessen & Robert M. Hunt, *An Empirical Look at Software Patents*, 16 J. Econ. & Mgmt Strategy 157, 171 (2007); Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 Tex. L. Rev. 961, 964 (2005); Iain M. Cockburn & Megan J. MacGarvie, *Entry and Patenting in the Software Industry* (NBER Working Paper No. 12563, Table 3 (2006)); Stuart J.H. Graham, et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 Berkeley Tech. L.J. 1255, 1277 (2009).

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[8] Available at: http://www.bsa.org/country/public%20policy/~/media/files/policy/security/general/sw_factsfigures.ashx.

[9] Available at: http://www.phil.frb.org/files/br/brq304rh.pdf.

A recent study by the National Science Foundation is informative. John E. Jankowski, *Business Use of Intellectual Property Protection Documented in NSF Survey*, National Science Foundation InfoBrief (February 2012).[10] In the information sector (which includes software, Internet, and Data processing) only 10 percent of companies found utility patents either "very" or even "somewhat" important. *Id.* at 3. Those companies rely instead on the copyright, trademark and trade secret protection discussed in the next section. *Id.* During the period 1994-2004, only 20 percent of software startup companies even applied for a patent. James Bessen, *A Generation of Software Patents*, Boston University School of Law Working Paper No. 11-31 (June 21, 2011) ("Bessen Generation") at 6.[11]

2. Other Legal and Economic Schemes Adequately Protect Computer Software

An important reason why most U.S. software developers still rarely patent their innovations is because copyright, trade secrecy, trademarks, and licensing are all available and widely used to protect programs and program innovations. *See, e.g.*, *Computer Associates Int'l v. Altai, Inc.*, 982 F.2d 693, 702 (2d Cir. 1992) (recognizing that copyright protects not only program code but also some of the structure, sequence, and organization of programs); *Rivendell Forest Prods. v. Georgia Pacific Corp.*, 28 F.3d 1042 (10th Cir. 1994) (applying trade secrecy law to computer programs); *Microsoft Corp. v. Harmony Computers & Electronics*, 846 F. Supp. 208 (E.D.N.Y. 1994) (recognizing trademark, as well as copyright, and breach of licensing claims in software). *See also Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 482-83 (1974) ("trade secret law protects items which would not be proper subjects for consideration for patent protection under 35 U.S.C. § 101.").

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[10] Available at: http://www.nsf.gov/statistics/infbrief/nsf12307/.

[11] Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1868979.

A recent empirical study of executives from software startups shows that copyrights, trademarks, and secrecy were more important than patents in providing software developers with competitive advantage in the marketplace. *See* Graham, *supra* at 1290. Patents were, in fact, perceived to be the least important means of attaining competitive advantage for software innovations. *Id.* This survey showed that software entrepreneurs regarded patents as providing relatively weak incentives to invest in software development. *Id.* at 1285.

Far more important than intellectual property rights to these software executives to gaining a competitive edge in the marketplace were first mover advantages and complementary assets. *Id.* at 1290. First movers in the software industry are often able to benefit from the existence of network effects to drive growth. *See, e.g.*, Michael Katz & Carl Shapiro, *Antitrust in Software Markets*, in Competition, Innovation, and the Microsoft Monopoly 32-34 (Jeffrey Eisenach & Thomas M. Lenard, eds. 1999); Mark A. Lemley & David McGowan, *Legal Implications of Network Effects*, 86 Cal. L. Rev. 479 (1998). Indeed, network effects were so powerful a driver of competitive advantage for Microsoft that the U.S. Department of Justice in the mid- and late 1990s attacked the firm as a monopoly for misusing its dominant position in the marketplace for operating systems. *Id.* at 500-06. *See United States v. Microsoft Corp.*, No. 94-1564 SS (D.D.C. 1994);[12] *United States v. Microsoft Corp.*, No. 98-1232 CKK (D.D.C. 1998).[13]

Among the complementary assets that can provide software developers with considerable revenues are integration, customization, and other types of services. For example, 57 percent of IBM's $99.87 billion in revenues in 2010 came from providing services to its customers. IBM Annual Report 25-26 (2010). This was more than double its revenues from sales of software and more than three times its revenues attributable to sale of computer systems. *Id. See generally* Michael Cusamano, *The Business of Software: What Every Manager, Programmer, and Entrepreneur Must Know to Thrive in Good Times and Bad* 273-74 (2004) (emphasizing the importance of services as a supplement to software sales).

There are several other reasons why patents play a modest role in the software industry. For one thing, patents are very costly to obtain and to enforce. Graham, *supra*, at 1313. Software entrepreneurs do not want to disclose their innovations if they can be kept secret. *Id.* They worry also that it will be easy to invent around any patent they might get. *Id.* Many also regard their software innovations to be unpatentable. *Id.*

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[12] Information available at: http://www.justice.gov/atr/cases/f0000/0045.htm.

[13] Information available at: http://www.justice.gov/atr/cases/ms_index.htm.

There is, moreover, a significant mismatch between the pace of evolution in the software industry and the processes of the patent system. Concerns about lack of expertise in the Patent Office and lack of awareness about the state of the art in software have continued to be pervasive and contribute to the problem of "bad" patents. *See, e.g.*, Pamela Samuelson, et al. *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 Colum. L. Rev. 2308, 2361-64 (1994).

3. The Historical Legal Background Illustrates How Software Patents Have Not Increased Growth or Innovation in the Software Industry

a. Legal Background Before 1994

To understand why software patents have played little to no positive role in the sustained and continued growth of the software industry, it is helpful to understand the relevant history in light of the legal background. Initially, there were both doctrinal and practical reasons for doubting the soundness of patenting software innovations, as a Presidential Commission reported in 1966:

> Uncertainty now exists as to whether the statute permits a valid patent to be granted on programs. Direct attempts to patent programs have been rejected on the ground of nonstatutory subject matter. Indirect attempts to obtain patents and avoid the rejection, by drafting claims as a process, or a machine or components thereof programmed in a given manner, rather than as a program itself, have confused the issue further and should not be permitted.

> The Patent Office now cannot examine applications for programs because of a lack of a classification technique and the requisite search files. Even if these were available, reliable searches would not be feasible or economic because of the tremendous volume of prior art being generated. Without this search, the patenting of programs would be tantamount to mere registration and the presumption of validity would be all but nonexistent.
>
> It is noted that the creation of programs has undergone substantial and satisfactory growth in the absence of patent protection and that copyright protection for programs is presently available.

Report of the President's Commission on the Patent System, *"To Promote the Progress of Useful Arts" in an Age of Exploding Technology* 13 (1966).[14]

Six years later, the U.S. Supreme Court concurred in the Commission's judgment when it encountered the first test case on the patentability of software innovations. *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972) (fully quoting the passage above). In line with the Presidential

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[14] Available at: http://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1010&context=historical.

In his tenure article, then Professor (now Justice) Stephen Breyer expressed reservations about the patenting of computer software innovations. *See* Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright for Books, Photocopies, and Computer Programs*, 84 Harv. L. Rev. 281, 347-49 (1970).

Commission's recommendations, the Patent Office had rejected Benson's application for a patent on a method of transforming numerical information from one form of representation to another (that is, a way to convert binary coded decimals into pure binary form). *Id.* at 64. One claim called for carrying out this method with the aid of a computer, while a second claim would have covered all ways of carrying out the method. *Id.* at 73-74.

The Court rejected patent protection for this method for several reasons. For one thing, it was influenced by an amicus curiae brief submitted by IBM Corp. which spoke of Benson's method as a "mathematical algorithm," the patenting of which would have "the general effect of extending patent protection to mathematical techniques, scientific principles, and other abstract concepts or rules." Brief Amicus Curiae of International Business Machines at 7, 9. This brief gave several examples of important mathematical discoveries that could only be effectively carried out by computer. *Id.* at 13-18. IBM warned of the "stifling effect" that patents on program methods would have on discourse in mathematical and scientific fields. *Id.* at 19. This resonated with the Court in Benson which spoke of "[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts" as unpatentable because "they are the basic tools of scientific and technical work." *Benson*, 409 U.S. at 67.

In the aftermath of the Court's ruling in *Benson*, it was widely believed that patents were unavailable for software innovations. *See, e.g.*, Office of Technology Assessment, Computer Software and Intellectual Property: Background Paper 8 (1990); National Commission on New Technological Uses of Copyrighted

Works, Final Report 16-17 (1979). The Court reinforced this conclusion when it ruled against another program-related invention in *Parker v. Flook*, 437 U.S. 584 (1978). Flook sought a patent for an improved method of analyzing data and updating alarm limits for catalytic conversion plants, the only novel element of which was an equation in the second step of the process. *Id.* at 585-88. The Court agreed with the Patent Office that this method was unpatentable under *Benson*, opining that merely adding some conventional or insignificant post-solution activities to a claim would not suffice to qualify the method for a patent. *Id.* at 590.

Three years later, the Supreme Court once again reviewed a patent claim for a computer-implemented method in *Diamond v. Diehr*, 450 U.S. 175 (1981). This time the Court upheld the patentability of a claim for an improved method of curing synthetic rubber that utilized a computer program as one component of the process. Because the Supreme Court was deeply divided (5-4 split) over the patentable subject matter issue in this case, and because rubber curing is a conventional technological process, it seemed for some time as though the door to patenting of software innovations had opened only slightly.[15]

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[15] For a fuller recounting of the history of software patenting decisions, *see, e.g.*, Maureen O'Rourke, *The Story of Diamond v. Diehr: Toward Patenting Software*, in Intellectual Property Stories 194-219 (Jane C. Ginsburg & Rochelle Cooper Dreyfuss eds. 2006); Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 Emory L.J. 1025 (1990).

b. 1994-1998: Alappat and State Street

Two significant Federal Circuit decisions caused a huge rise in software patenting. The first was the en banc ruling, *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994), in which the Federal Circuit concocted the notion of broad software patents. *Alappat* upheld a claim for a computerized apparatus for creating a smooth waveform display for oscilloscopes using an anti-aliasing technique. The Patent Office had rejected the claim because it was for a mathematical method for calculating numerical values. *Id.* at 1539-40. A plurality opinion questioned whether the *Benson* exclusion of mathematical methods applied to apparatus claims. *Id.* at 1542. In the plurality's view, Alappat's claim was "not [for] a disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete and tangible result." *Id.* at 1544. The plurality regarded general purpose computers as new machines whenever loaded with programs that made them into special purpose machines. *Id.* at 1545. Notably, in his dissent, Chief Judge Archer warned that allowing for this type of broad § 101 interpretation, a compact disc player would be a different machine each time a different compact disc was played inside. *Id.* at 1553-54 (Archer, C.J. dissenting).

The *Alappat* decision "opened the way for a large-scale increase in the patenting of software." Bessen Generation, *supra*, at 2. *See also* Brief of Dale R. Cook at 2 (*Alappat* "changed everything"); Brief of IEEE-USA at 6 (noting industry "reliance" on *Alappat*).

A second contributor to the current surge in software patents was *State Street Bank & Trust v. Signature*

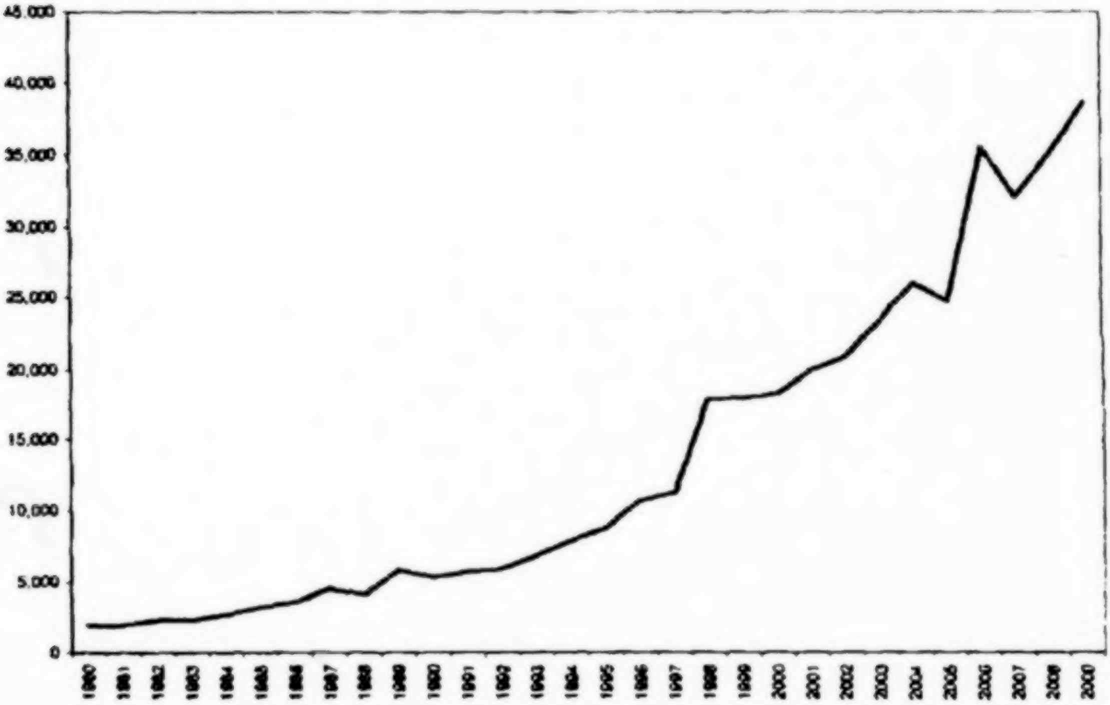
Financial Group, Inc., 149 F.3d 1368 (Fed. Cir. 1998). State Street had obtained a patent on a data processing system for configuring financial services with a hub and spoke model. After it sued Signature Financial for patent infringement, Signature Financial challenged the validity of State Street's patent on subject matter grounds. The Federal Circuit upheld the validity of the patent, invoking the standard that the *Alappat* plurality had endorsed:

> Today we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm because it produces a 'useful, concrete and tangible result"—a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

Id. at 1373.

Following the Federal Circuit's decisions in *Alappat* and *State Street*, the "useful, concrete and tangible result" standard for patentable subject matter contributed to a very substantial surge in the patenting of software. It seemed as though *Benson* and *Flook* had, in effect, been overruled. The biggest spike in applications and in issuance of software patents began in 1994. Bessen Generation, *supra*, at 26, Fig. 1:

Figure 1. Annual grants of US software patents.



Note the increase in 1994, and the sharp increase starting in 1997—corresponding to the approximate three-year window of time for the Patent Office to examine and allow patent applications. *See also* Brief of IEEE-USA at 30, Fig. 1 (showing a similar graph as Bessen Generation, *supra*, Fig. 1). However, as noted above, that shift in the patenting of software provided no additional stimulus to the already growing software industry.

C. If Anything, Evidence Shows that the U.S. Software Industry is Harmed by the Exponential Growth of Vague Software Patents

1. Software Patent Litigation Has Dramatically Increased

This increase in software patents has been quite costly, not just in fees to the Patent Office, but in harm to innovative companies who increasingly face those patents in an explosion of software patent litigation. In fact, contrary to what Alice and its amici argue, there is significant empirical evidence, particularly in recent years, that software patents actually harm the industry. To understand, one must look at recent trends in patent litigation. There were 5,189 patent actions filed in 2012, compared to fewer than 3,000 such actions filed in 2009. Chris Barry et al., *2013 Patent Litigation Survey*, PricewaterhouseCoopers, 6 (2013) ("PWC 2013").[16]

Litigation involving software patents has also rapidly increased, at a rate far higher than in other technological areas, Bessen Generation, *supra*, Fig. 3 at 19:

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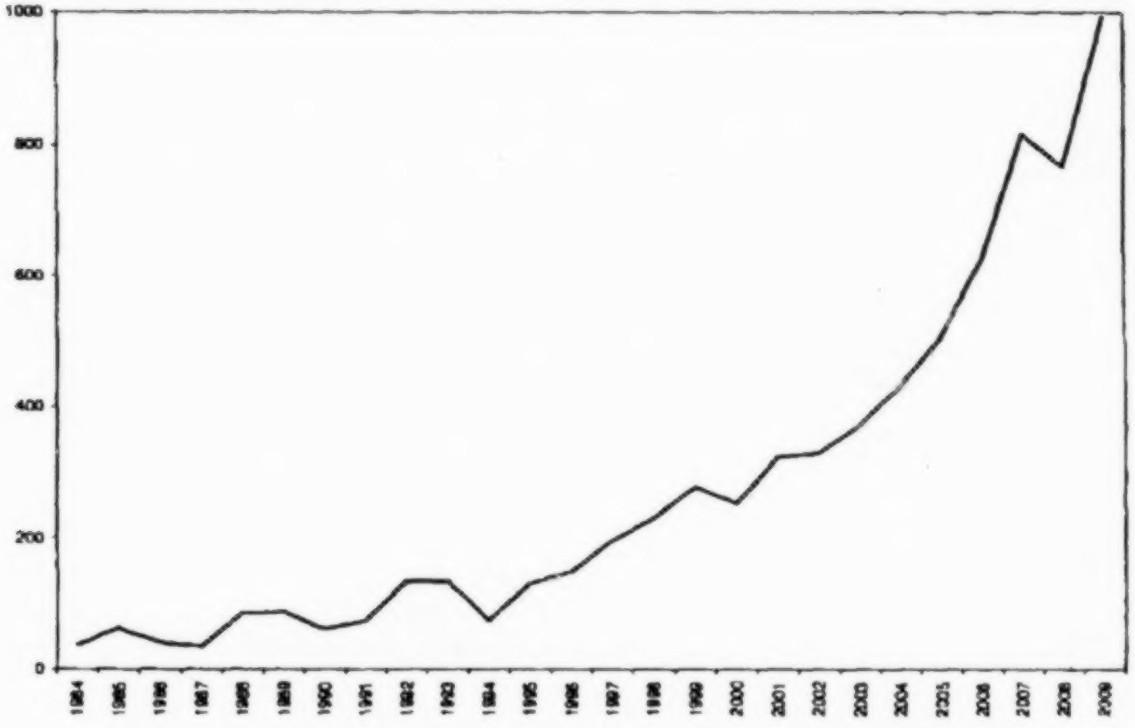
[16] Available at: http://www.pwc.com/en_US/us/forensic-services/publications/assets/2013-patent-litigation-study.pdf.

Figure 3. Number of patent lawsuit filings involving software patents



One study has found that between 2007 and 2011, 46 percent of patent lawsuits involved software patents, accounting for 89 percent of the increase in the number of patent defendants during this timeframe. United States Government Accountability Office, *Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality*, 22 (2013) ("GAO Report").[17] *See also* PWC 2013, *supra*, at 14 (software and Internet/online services industries "experienced significant increases in identified decisions from 2007 through 2012."); James Bessen & Michael Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk* 191, Table 9.1 (2008) (Software patents are more than twice as likely to be litigated as are other patents; business-method patents are nearly seven times more likely to be litigated); Bessen Generation, *supra*, at 259.

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[17] Available at: http://www.gao.gov/assets/660/657103.pdf.

Much of this litigation involves patent cases brought by non-practicing entities (NPEs), also known as patent assertion entities (PAEs), patent monetizers, or colloquially, "patent trolls," which have significantly increased in recent years. PWC 2013, *supra*, at 7; *see also* Executive Office of the President, *Patent Assertion and U.S. Innovation*, 5 (2013) (finding a "dramatic increase" in PAE activity in recent years).[18]

2. The High Costs of Software Patent Litigation Fall Largely on Small Innovative Companies

This explosion of litigation has been costly. According to a congressional study, NPEs activity cost defendants and licensees $29 billion in 2011, a 400 percent increase over $7 billion in 2005, and the losses are mostly deadweight, with less than 25 percent flowing to innovation and at least that much going towards legal fees. Brian T. Yeh, *An Overview of the "Patent Trolls" Debate,* Cong. Research Serv., R42668, at Summary and 2 (2012) ("Yeh")[19] (citing James Bessen & Michael Meurer, *The Direct Costs from NPE Disputes*, Boston Univ. School of Law, Law and Economics Research Paper No. 12-34 (2012) ("Bessen

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[18] Available at: http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf.

[19] Available at: https://www.eff.org/sites/default/files/R42668_0.pdf.

2012") at 1, 17-18.).[20] The research shows that that "NPE lawsuits are associated with half a trillion dollars of lost wealth to defendants from 1990 through 2010. During the last four years the lost wealth has averaged over $80 billion per year." James Bessen, Jennifer Ford and Michael Meurer, *The Private and Social Costs of Patent Trolls*, Boston Univ. School of Law, Working Paper No. 11-45 (2011) ("Bessen 2011") at 2.[21]

One study found that software patents account for 74-93 percent of NPE lawsuits. John Allison, Mark A. Lemley and Joshua Walker, *Patent Quality and Settlement Among Repeat Patent Litigants*, 99 Geo. L. J. 677, 695-96 (2010).[22] Thus, the software industry bears a large percentage of NPE-related costs. As the congressional study noted:

> Experts attribute the proliferation of PAEs over the past 10 to 15 years to the explosion of the information technology (IT) industry and patent law's struggle to adapt to the unique issues presented by this new frontier of innovation. They indicate that the PAE business model is not about licensing patents generally but *high-tech* patents in particular, including those on software and business methods or processes related to software, as well as computers and electronics.

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[20] Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2091210.

[21] Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272.

[22] Available at: http://georgetownlawjournal.org/files/pdf/99-3/AllisonLemleyWalker%2520677-712.PDF.

Yeh, *supra*, at 8 (footnotes omitted). Several technology companies have publicly reported that they have increasingly become the subject of patent litigation lawsuits by NPEs in the last ten years. *See, e.g.*, GAO Report, *supra*, at 16.

The litigation explosion particularly burdens small companies, which often find themselves the targets of these suits. One study has found that nearly 75 percent of venture capitalists have had their portfolios impacted by litigation from a patent troll. Colleen Chien, *Patent Assertion and Startup Innovation*, New America Foundation (Sept. 2013) at 10.[23] More than half of the defendants involved in litigation brought by patent NPEs are companies with annual revenues of $10 million or less. *Id.* at 11. Litigation-based legal expenses can kill small startups entirely, and the mere threat of those expenses can chill innovation. In a small company, key management and engineers must deal with an NPE claim. Colleen Chien, *Startups and Patent Trolls* (Santa Clara Univ. School of Law, Legal Studies Research Paper Series, Accepted Paper No. 09-12, 2012) at 10-13.[24] Professor Chien noted:

> Although large companies tend to dominate patent headlines, most unique defendants to patent troll suits are small. Companies with less than $100M annual revenue represent at least 66% of unique defendants and the majority of

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[23] Available at: http://www.newamerica.net/sites/newamerica.net/files/policydocs/Patent%20Assertion%20and%20Startup%20Innovation_updated.pdf.

[24] Available at: http://ssrn.com/abstract=2146251.

> them make much less than that: at least 55% of unique defendants in PAE suits make under $10M per year. Suing small companies appears to distinguish PAEs from operating companies, who sued companies with less than $10M of annual revenue only 16% of the time, based on unique defendants.

Id. at 1-2. This results in small cash-poor companies becoming vulnerable targets that lack leverage to deal with an NPE claim, leaving them stuck paying nuisance settlements regardless of the merits of the underlying claim. *Id.* at 3. With small- and medium-sized companies making up 90 percent of the defendants in NPE suits, Bessen 2012, *supra*, at 13, such nuisance settlements are widespread.

In another troubling trend, small companies increasingly find themselves targeted by NPEs based on their use of basic technologies, for actions such as using a scanner or wireless Internet. Joe Mullin, *Patent Trolls Want $1,000—For Using Scanners*, Ars Technica (Jan. 2, 2013) (stating "2012 may go down as the year of the user").[25] This problem is widespread: one NPE alone, who claims to own a patent covering the technology behind scanning documents to email, has sent demand letters to at least 16,465 companies across the country accusing those companies of patent infringement. *See MPHJ Tech. Invs., LLC v. FTC*, No. 6:14-cv-00011 WSS (W.D. Tex. 2014).[26]

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[25] Available at http://arstechnica.com/tech-policy/2013/01/patent-trolls-want-1000-for-using-scanners.

[26] Information available at: https://ia600804.us.archive.org/28/items/gov.uscourts.txwd.669787/gov.uscourts.txwd.669787.1.0.pdf

Moreover, one analysis has found that the top ten patent litigation campaigns over the past three years (as determined by number of named defendants) all involved users and implementers of a technology. Chien, *Patent Assertion and Startup Innovation*, *supra*, at 12. Small companies are particularly vulnerable to such lawsuits, as they are unlikely to have been able to negotiate indemnity protection. *Id.* at 13.

3. Unclear Software Patents Make the Costs of Litigation Even Worse

Finally, NPEs have found success with their "business model" by asserting hard-to-understand patents with overbroad claims. The type of software patents that NPEs use to litigate[27] are "notoriously difficult to interpret." Bessen 2012, *supra*, at 8. As Professor Lemley notes:

> A related problem is the uncertainty associated with the meaning and scope of a software patent. Unlike chemistry and biotechnology, where we have a clear scientific language for delineating what a patent claim does and doesn't cover, there is no standard language for software patents. Accordingly, no one can really know what a software patent covers until the court has construed the language of the patent claims.

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[27] As noted previously, software patents account for 74-93 percent of NPE lawsuits. Allison et al., *supra*, at 695-96.

Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905, 930 (2013) (footnote omitted) ("Lemley"). (This claiming problem is one of the subjects of *Nautilus, Inc. v. Biosig Instruments, Inc.*, 715 F.3d 891, *cert. granted*, 82 U.S.L.W. 3195 (U.S. Jan. 10, 2014) (No. 13-369).)

In other words, "software patents have 'fuzzy boundaries': they have unpredictable claim interpretation and unclear scope . . . and the huge number of software patents granted makes thorough search to clear rights infeasible, especially when the patent applicants hide claims for many years by filing continuations. This gives rise to many situations where technology firms inadvertently infringe." Bessen 2011, *supra*, at 24. This lack of clarity directly feeds into the NPE business model and, consequently, the recent increase in both NPE and software patent litigation. Specifically, "there is a business opportunity based on acquiring patents that can be arguably read to cover existing technologies and asserting those patents, litigating if necessary in order to obtain a licensing agreement. . . . the patent troll business model only makes economic sense when there is such inadvertent infringement." *Id.*

All this means is that there has been "a substantial increase in litigation risk and hence a disincentive to invest in innovation." Bessen Generation, *supra*, at 20.

II. A Robust Section 101 Will Help Avoid Widespread Preemption of Abstract Ideas that Inherently Belong in the Public Domain

A. Section 101's Concern with Preemption Is Intended to Serve the Public Interest

As the Court has noted, one of § 101's core tenets is to eliminate the threat of unnecessarily preempting further innovation. In *Benson*, for instance, this Court declined to grant patent protection when the "mathematical formula involved ...[had] no substantial practical application except in connection with a digital computer ... [for fear that] the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." *Benson*, 409 U.S. at 71-72. And more recently in *Bilski v. Kappos*, this Court highlighted that the threshold question of abstractness serves as an important check on inventions that could "pre-empt use of [an abstract] approach in all fields, [] . . . effectively grant[ing] a monopoly over an abstract idea." *Bilski*, 130 S. Ct. at 3231.

It goes without saying that the patent system is one of incentives. Not only does Article I, § 8, cl. 8 of the Constitution make that clear with its admonition that Congress "promote the Progress of Science and useful Arts," but so does this Court's jurisprudence. For instance, in *Pfaff v. Wells Electronics, Inc.*, 525 U.S. 55, 63 (1998), the Court said:

> the patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and

> useful advances in technology, in return for an exclusive monopoly for a limited period of time. The balance between the interest in motivating innovation and enlightenment by rewarding invention with patent protection on the one hand, and the interest in avoiding monopolies that unnecessarily stifle competition on the other, has been a feature of the federal patent laws since their inception.

It is no wonder, then, that the doctrine of preemption serves as a helpful lens through which to view the oftentimes complicated questions of incentives and competition that naturally arise when the government finds itself in the business of granting monopolies. When the grant of the monopoly is too wide, second movers lose incentive to create. *Medtronic, Inc. v. Mirowski Family Ventures, Inc.*, 134 S. Ct. 843, 851 (2014) ("The public interest, of course, favors the maintenance of a well-functioning patent system. But the 'public' also has a 'paramount interest in seeing that patent monopolies ... are kept within their legitimate scope.'") (internal citations omitted). The preemption doctrine helps insulate that public interest from the creep of overbroad monopolies:

> But even though there are other doctrines that can be used to protect competitive development, a preemption doctrine is nonetheless critical. All the other requirements permit patents—they will simply be narrower than might otherwise be claimed, or delayed until a use is identified. Yet because patents—once issued—cover all uses, there will be situations where even very narrow patents block off too much, especially

> in areas (like computer science and genetic diagnostics) where applications flow easily from basic discoveries.

Rochelle C. Dreyfuss & James P. Evans, *From Bilski Back to Benson: Preemption, Inventing Around, and the Case of Genetic Diagnostics*, 63 Stan. L. Rev. 1349, 1359 (2011).

Section 101 is *the* section of the Patent Act situated to do the heavy lifting with regard to preemption. In *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, this Court unanimously "decline[d] . . . to substitute §§ 102, 103, and 112 inquiries for the better established inquiry under § 101." 132 S. Ct. 1289, 1304 (2012) (rejecting the argument that §§ 102, 103, and 112 could perform § 101's "screening function"). Otherwise, "to shift the patent-eligibility inquiry entirely to these later sections risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do." *Id.*

B. At a Minimum, Performance of an Otherwise Abstract Idea "on a Computer" or "on the Internet" Should Not Make that Idea Non-Abstract

In effort to avoid preemption, courts have rightfully found that performing an abstract idea on a general purpose computer, without more, does not make that invention patent-eligible. For example, in *Dealertrack, Inc. v. Huber*, 674 F.3d 1315 (Fed. Cir. 2012), the Federal Circuit found claims impermissibly abstract when they were "silent as to how a computer aids the method, the extent to which a computer aids the method, or the significance of the computer to the performance of the method," even though the patent at issue limited the claims to "computer-aided." *Id.* at 1333. Following the reasoning first laid out in *Benson,* the Federal Circuit held:

> Because the computer here "can be programmed to perform very different tasks in very different ways," *Aristocrat,* 521 F.3d at 1333, it does not "play a significant part in permitting the claimed method to be performed." *Cybersource,* slip op. at 19 (citing *SiRF Tech.,* 601 F.3d at 1333). Simply adding a "computer aided" limitation to a claim covering an abstract concept, without more, is insufficient to render the claim patent eligible. *See SiRF,* 601 F.3d at 1333 ("In order for the addition of a machine to impose a meaningful limit on the scope of a claim, it must play a significant part in permitting the claimed method to be performed, rather than function solely as an obvious mechanism for permitting a solution to be achieved more quickly, i.e., through the utilization of a computer for performing calculations.").

Dealertrack, 674 F.3d at 1333; *see also CLS Bank Int'l v. Alice Corp.,* 717 F.3d 1269, 1283-84 (Fed Cir. 2013) (en banc) ("bare field-of-use limitations cannot rescue a claim from patent ineligibility where the claim as written still effectively preempts all uses of a fundamental concept within the stated field.") (Lourie, J. concurring).

Unfortunately, as the instant case demonstrates, the Federal Circuit has failed to demonstrate consistency with regard to its own rule that tying an otherwise abstract idea to a general purpose computer does not make that idea patent-eligible. The claims at issue here, like those in *Dealertrack*, *Benson*, and *Bilski*, take an abstract idea—using a third-party intermediary to settle risk—and merely tie that idea to a general "data processing system" (in the system claims) and a "computer program … comprising a computer readable storage medium" (in the media claims). CLS Bank Br. at 48-51. Nevertheless, five judges on the Federal Circuit would have found these system claims patent-eligible.

Essentially, if those judges had their way, and the patents were found patentable, Alice Corp. would own practically all implementations of the general idea of using third-party intermediaries to eliminate risk (essentially realizing Chief Judge Archer's warning in *Alappat*, *supra* at 22). Can one even imagine an implementation of that idea in modern times that would not take place on a "data processing system"? As this Court made clear in *Bilski*:

> The Information Age empowers people with new capacities to statistical analyses and mathematical calculations with a speed and sophistication that enable the design of protocols for more efficient performance of a vast number of business tasks. If a high enough bar is not set when considering patent applications of this sort, patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change.

130 S.Ct. at 3229.

These dangers appear not just when inventions are tied to general purpose computers, but also to the Internet, as in a patent that merely claims its invention is conducted "online." Another case, *WildTangent, Inc. v. Ultramercial, LLC.*, 722 F.3d 1335 (Fed. Cir. 2013) *petition for cert. filed*, (U.S. Aug. 23, 2013) (No. 13-255), which currently has a petition for certiorari pending before the Court, well illustrates this point. The *Ultramercial* case involves U.S. Patent No. 7,346,545 ("the '545 Patent"), which claims the method of distributing ads "over the Internet." This supposedly allows consumers to view ads online before accessing content protected by intellectual property rights in lieu of paying for that content. *See generally* '545 Patent, col. 8, lines 5-48; col. 9, line 1 to col. 10, line 9 (claims 1 and 8).

When taken together, the claims of the '545 Patent contain nothing more than an abstract process, at best solely tied "to a particular technological environment." *See Bilski*, 130 S. Ct. at 3230. The initial Federal Circuit panel that investigated the '545 Patent held that it was not impermissibly abstract because many of claimed steps "*are likely* to require intricate and complex computer programming" and that "certain of these steps clearly require specific application to the Internet and a cyber-market environment." *Ultramercial, LLC v. Hulu, LLC*, 657 F.3d 1323, 1328 (Fed. Cir. 2011) (emphasis added). But claims that "likely" require complex programming to apply to "the Internet" simply do not lead to the conclusion that that '545 Patent's invention—"a method for monetizing and distributing copyrighted products," essentially using advertising—is anything other than impermissibly abstract.

Even if the claims were "likely" to require programming, in fact they did ***not*** recite any programming steps, and even if they did recite such steps, the '545 patent would still be impermissibly abstract under § 101. This is because, of course, much of the business we conduct on a daily basis now takes place on the Internet. For example, 71 percent of U.S. households used the internet in 2011. *Computer and Internet Use in the United States*, U.S. Census Bureau (May 2013).[28] Increasingly, the public uses the Internet for everyday commercial activities formerly done on Main Street. Given this reality, merely tying an otherwise abstract business method to that environment cannot be sufficient to make that method patentable, any more than tying such a method to a public road.

"On the Internet," just like a "data processing system" or a "computer readable storage medium," has become a commonplace term in today's world. As such, tying an invention simply to the Internet or a general purpose computer should never alone be enough to make an otherwise abstract idea patent eligible. Indeed, "[g]iven the ubiquity of computers in contemporary life, allowing a process to become patentable simply because it is computer-implemented or invokes the use of the Internet would render the subject-matter eligibility criteria contained in section 101 virtually meaningless." *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1267 (2012) (Mayer, J. dissenting). This Court should enact a clear rule saying as much.[29]

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[28] Available at: http://www.census.gov/prod/2013pubs/p20-569.pdf.

[29] This is not to say that the Court should not, too, apply a rule defining what inventions are otherwise abstract or not. It

III. Section 101, When Properly Applied, Can Be a Powerful Tool to Curb Litigation Abuse

This inability to discern a patent's scope or assess its validity leads to two distinct unfortunate results: (1) it drives parties to litigate cases that might otherwise fairly settle; and/or (2) it encourages parties to accept settlements that do not reflect the real value of the technology at issue (or the merits of the case). Thus, the present state of confusion surrounding § 101 blunts an otherwise powerful incentive to dispose of cases at the summary judgment stage (or earlier), before the need to engage in expensive and lengthy discovery.

Widespread agreement exists that the harm from NPEs outweighs any benefit they provide. Yeh, *supra*, at Summary, 2, 6; *supra* at Section I.C.2. Despite this, there is an apparent lack of consensus as to the best way to fix the problem. One crucial way to stem abuse by NPEs is to create incentives for those facing litigation (or litigation threats) to pursue their meritorious defenses of noninfringement and invalidity. *Id.* at 5 (citing Allison, Lemley & Walker, *supra*, at 694) ("Studies suggest that [non-practicing entities] rarely prevail on the merits. Their win rate in cases decided on the merits is just 8 percent, versus 40 percent for other entities . . . . But they persist with litigation nonetheless, apparently supported by the licensing fees obtained by posing a credible threat of *extended* litigation.") (emphasis added).

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is merely to say that, at a minimum, application of an otherwise abstract idea to the Internet or a general purpose computer does not somehow make that abstract idea miraculously patentable.

Indeed, the most troubling aspect of the NPEs' business model—the push to deter meritorious litigation in lieu of cheaper licensing deals—is necessarily discouraged by additional opportunities to appropriately dispose of cases at the early stages of litigation. Defendants who might otherwise choose to settle rather than litigate a meritorious case will be incentivized to do so if they might be able to see that case disposed of efficiently. Finally, the ability to address § 101 issues at early stages of litigation will not harm the rights of any non-practicing entity (or of any plaintiff) who attempts to enforce a patent that is non-abstract.

Thus, several cases have properly decided § 101 issues at an early stage, either by summary judgment or on a motion to dismiss. *See, e.g., Bancorp Servs., L.L.C. v. Sun Life Assurance Co.*, 687 F.3d 1266, 1273-74 (Fed. Cir. 2012); *OIP Techs., Inc. v. Amazon.com, Inc.*, No. C-12-1233 EMC, 2012 WL 3985118 (N.D. Cal. Sept. 11, 2012); *Glory Licensing, L.L.C. v. Toys "R" Us, Inc.*, No. 09-4252 FSH, 2011 WL 1870591 (D. N.J. May 16, 2011); *Uniloc USA, Inc. v. Rackspace Hosting, Inc.*, No. 12-CV-375 (E.D. Tex. March 27, 2013); *Cyberfone Systems, LLC v. Cellco P'ship, et al.*, No. 11-827-SLR through 11-835-SLR (D. Del. Aug. 16, 2012). Moreover, in *Mayo*, this Court has already stated that § 101 should play that role: "to shift the patent-eligibility inquiry entirely to these late sections [§§ 102, 103, 112] risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do." 132 S. Ct. at 1304. As this Court understands, the trend of using § 101 early in litigation should be encouraged, and this case serves as a proper vehicle to do just that.

CONCLUSION

The Court should affirm the judgment below, with directions to the Federal Circuit that § 101 should strictly limit the scope of patent eligible subject matter.

February 27, 2014

Respectfully submitted,

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Supreme Court, U.S.
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ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, et al.,

Respondents.

◆

On Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

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BRIEF OF AMICI CURIAE PROFESSOR ROBIN FELDMAN AND THE U.C. HASTINGS INSTITUTE FOR INNOVATION LAW ON BEHALF OF NEITHER PARTY

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INTEREST OF THE *AMICI CURIAE*[1]

Amicus curiae Professor Robin Feldman is an expert in intellectual property law, particularly issues involving the sciences, intellectual property monetization, and the intersection of intellectual property and antitrust. She is a Professor of Law at the University of California, Hastings College of the Law, and holds the Harry & Lillian Hastings Chair. Professor Feldman is Director of *amicus curiae* the Institute for Innovation Law, which is focused on innovation at the crossroads of intellectual property and emerging technology. She also directs client-based education, including the Startup Legal Garage, and writes extensively about intellectual property issues. She has received multiple awards for teaching and scholarship, and has published two books, *Rethinking Patent Law* (Harvard 2012) and *The Role of Science in Law* (Oxford 2009), in addition to numerous articles in law reviews and the New England Journal of Medicine. Professor Feldman has testified before Congress and the California legislature on intellectual property issues, and has provided commentary for the Federal Trade Commission, the Department of Justice, and the Patent and Trademark Office. Her empirical work on patent trolling was cited in the 2013 White House Report on Patent Assertion.[2]

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[1] Counsel for all parties has consented to the filing of this brief, as indicated by consents lodged with the Clerk of this Court. No counsel for any party had any role in authoring this brief, and no person other than the named *amici* and their counsel has made any monetary contribution to the preparation of this brief. *See* Rule 37.6.

Amici curiae Professor Feldman and the Institute for Innovation Law at the University of California, Hastings College of the Law have a strong interest in the development of a coherent test for patentable subject matter under 35 U.S.C. § 101. *Amici* submit this brief to offer for the Court's consideration a framework under 35 U.S.C. § 101 for analyzing the software patentability issues raised in this case, which can also be applied rationally across innovation, including in other emerging areas such as biology and business methods.

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SUMMARY OF ARGUMENT

Computers, unfortunately, do not speak English. Thus, software uses languages that are a translation of English, and other human languages, into a numerical code computers can understand. Like words in any language, software can express the sublime or the mundane. And, like words in any language, software can be a translation of a law of nature or a translation of an innovative idea.

Software's subject matter patentability is determined not by the words or characters used, but by the content of what is being expressed and the preemptive effect that might result from patenting that type of content. Despite the Court's precedents to that effect, the lower courts have been unable to reach a consensus on this point, much less a workable doctrine.

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[2] Exec. Office of the President, *Patent Assertion and U.S. Innovation* (June 2013).

This Court's first forays into computer-related inventions concerned computer code that was normally integrated into hardware inventions. *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Parker v. Flook*, 437 U.S. 584, 594 (1978); *Diamond v. Diehr*, 450 U.S. 175, 192-93 (1981). Later, when technological advancements raised the question of whether pure software inventions could be patentable, the Federal Circuit, quite simply, got it wrong. The Circuit misinterpreted this Court's early cases to suggest that a proper software patent is an abstract document, one that covers vast swaths of territory. *In re Alappat*, 33 F.3d 1526, 1542-43 (Fed. Cir. 1994). This misinterpretation has spawned two decades of software patents that constitute no more than abstract ideas and threaten to preempt laws of nature. In fact, the type of patents that are commonly accepted for software today would be summarily rejected if they were offered for other types of inventions.

With the Court's decision to address the patentability of software in this case, *amici* hope that correcting the Circuit's misinterpretation will be the first order of business, refocusing the analysis on whether the subject matter of a particular patent threatens preemption. Indeed, such clarification will greatly assist the lower courts, the Patent and Trademark Office, and patent applicants themselves in understanding that software patents are no different than other types of patents, and should be tested in the same rigorous manner required throughout the patent system.

Importantly, in clarifying the test for software patentability, there is a unique opportunity to create logical coherence throughout patentable subject matter doctrines – regardless of whether those doctrines relate to product patents or process patents, business methods or biotechnology. The key to creating coherence throughout patentable subject matter lies, as the Court's early cases make clear, in ensuring that an invention has *specific commercial application*. This distinction provides the foundation for the Court's decisions to find patentable subject matter in certain cases, while declining to find patentability in others.[3] Indeed, as set forth more fully below, specific commercial application is the unifying concept in the Court's prior decisions, and applies logically to all software cases, including the one at bar, and to all areas of subject matter patentability.

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[3] *Compare Benson*, 409 U.S. at 69, 72 (rejecting patentability because algorithm to convert binary coded decimal numerals into pure binary code is not a "process" under § 101) and *Flook*, 437 U.S. at 594 (rejecting patentability of a procedure to monitor multiple conditions during the catalytic conversion process because the claim was "directed essentially to a method of calculating, using a mathematical formula, ...") (quotation omitted) *with Diamond*, 450 U.S. at 192-93 (upholding patent on process for curing synthetic rubber because it did not attempt to "[p]atent a mathematical formula, but rather . . . an industrial process").

Testing for specific commercial application ensures that a patent covers an application of a law of nature – rather than the law itself – and that the patent meets the constitutionally mandated standard of promoting the progress of the "useful arts." *Mayo Collaborative Services, et al. v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1294 (2012) ("As the Court has also made clear, to transform an unpatentable law of nature into a patent-eligible *application* of such a law, one must do more than simply state the law of nature while adding the words 'apply it.'") (emphasis in original).

Predicated on the Court's teachings, set forth herein is a proposed framework for determining patentable subject matter under 35 U.S.C. § 101, one that can be used in connection with the software-related issues presented in this case and across innovation generally, focusing on both preemption and the tests for patentability as a whole.

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ARGUMENT

I. COMPUTERS DO NOT SPEAK ENGLISH; SOFTWARE IS A LANGUAGE TRANSLATION THE PATENTABILITY OF WHICH SHOULD DEPEND ON THE SUBSTANCE OF WHAT IS TRANSLATED: AN APPLIED INVENTION OR A LAW OF NATURE

The current crisis in patentable subject matter (highlighted by the conflicting opinions and fractured panel below) can be traced to the emergence of computer technology in the American industrial landscape. Computer programs brushed up against a number of prohibitions in subject matter patentability. At first blush, a computer program looks a great deal like a formula, or pure math, categories this court has long excluded from patentability. *Prometheus,* 132 S. Ct. at 1293. If mathematical formulas are unpatentable, how can a computer program be patentable?

Part of the difficulty can be traced to confusion between the content of something that is being expressed and the language in which it is expressed. We know, for example, that laws of nature are not patentable. Some of these laws are familiar to us in the formulaic language in which we normally see them expressed. Most people would recognize one of Einstein's laws of physics expressed as $E=mc^2$. One could express that same law in prose, however, rather than formulaic language, by explaining the way in which matter and energy are interchangeable. The choice of language is irrelevant. We disallow patenting of $E=mc^2$ not because it is expressed in mathematical form but because it represents one of the building blocks of scientific exploration and endeavor. *Id.* Patenting that law would preempt scientific exploration by occupying a basic concept. In addition to laws of physics, other things can be expressed in formulaic language. Expressing something in formulaic language does not, however, mean that what is being expressed is a law of nature. Thus, the fact that computer programs are expressed in formulaic language which looks somewhat like math does not mean the concepts underlying a particular program are analogous to a law of nature.[4]

This confusion is likely the cause of the lower court's analytical errors, which run contrary to the Court's precedent that focuses on the importance of preemption and the necessity of cabining inventions within "definite bounds." *Benson,* 409 U.S. at 69. The Court's early case law on computer-related inventions arose in a series of three cases concerning a generation of inventions that were typically hard-wired into the machines themselves. In the 1972 case of *Gottschalk v. Benson*, the Court denied patentability to a process for programming a computer to convert numbers from the binary-coded decimal system into pure binary form. *Id.* at 72. Similarly, in the 1978 case of *Parker v. Flook,* 437 U.S. 584 (1978), the Court denied patentability to a process that involved programming an alarm to signal when a catalytic conversion process reached a danger point. Finally, in the 1981 case of *Diamond v. Diehr,* 450 U.S. 175 (1981), the Court upheld patentability of an invention related to "a process for curing rubber which includes in several of its steps the use of a mathematical formula and a programmed digital computer." *Id.* at 177.[5]

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[4] Some would argue that all math is invented, and that it is a human-made method of imposing order and structure on the natural world. For an interesting and accessible discussion of Wittgenstein's view that all mathematics is a human invention and various responses to that argument, *see* Ludwig Wittgenstein, *Wittgenstein's Philosophy of Mathematics* § 3.1, http://plato.stanford.edu/entries/wittgenstein-mathematics.

Throughout these cases, the Court emphasized three points, as it recently reiterated. First, patent eligibility must *not* depend on clever draftsmanship. *Prometheus*, 132 S. Ct. at 1294 (precedents "warn us against interpreting patent statutes in ways that make patent eligibility 'depend simply on the draftsman's art' without reference to the 'principles underlying the prohibition against patents for [natural laws].' "), quoting *Flook,* 437 U.S. at 593. Second, care must be taken to ensure patents do not preempt laws of nature or entire areas of natural phenomena. *Id.* (precedents "warn us against upholding patents that claim processes that too broadly preempt the use of a natural law"), citing *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1853); *Benson*, 409 U.S. at 71-72. Third, patents drawn without any limitations, such as those related to a particular art, technology, or end, are problematic. *Id.*, citing *Flook*, 437 U.S. at 5894, *Bilski v. Kappos*, 130 S. Ct. 3218, 3220 (2010), and *Diehr*, 450 U.S. at 191-92; *see also Benson*, 409 U.S. at 64 (rejecting patentability where "the claims were not limited to any particular art or technology, to any particular apparatus or machinery, or any particular end use.").

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[5] For a description of the inventions at issue in these cases and a more detailed discussion of the Court's holdings, *see* Robin Feldman, *Rethinking Patent Law* (Harvard 2012) at 105-07.

In the period following *Benson*, *Flook*, and *Diehr*, computer technology advanced rapidly. Among other changes, a new generation of computer-related inventions came about that were not hard-wired into machines but, rather, were embodied as pure software. Concerned about avoiding the appearance of a mathematical formula, patent drafters began to file patents that merely described the process of what was happening in simple English prose. These patents focused on the *result* of the invention, rather than the steps taken to get there, an approach unheard of for other types of inventions. Nevertheless, connecting the invention to an industrial endeavor focused attention on the industrial art involved in the invention as a whole and not the appearance of math or abstractions. The advantages were obvious: Given that broad, abstract language had the potential to cover many different ways of accomplishing the same result, inventors were allowed to tie up large areas of innovation. The Federal Circuit, when called upon to adjudicate the propriety of this approach, unfortunately acquiesced.

A. IN DECIDING WHETHER SOFTWARE IS PATENTABLE UNDER SECTION 101, THE FEDERAL CIRCUIT MISINTERPRETED THIS COURT'S PRECEDENTS IN HARDWARE CASES TO ALLOW ABSTRACT PATENTS COVERING VAST SWATHS OF TERRITORY – AN APPROACH UNHEARD OF FOR OTHER TYPES OF INVENTIONS

In the 1994 case of *In re Alappat,* 33 F.3d 1545 (Fed. Cir. 1994), the Federal Circuit faced the question of whether pure software inventions are patentable. *Alappat* concerned a software program for making lines on a computer appear smooth to the human eye. *Id.* at 1557-58. The Federal Circuit focused simply on the question of whether the invention could be tied to a specific type of machine, similar to the rubber-curing machine in *Diehr.* In so doing, however, the Circuit lost sight of *Diehr*'s animating logic. The Circuit misinterpreted the Court's instructions about focusing on inventions applied to particular industrial processes and avoiding mathematical formulas. These admonitions were read to suggest that a proper computer-related patent is one expressed in just the type of broad prose terms described above – ones that need only describe the result of the invention and explain how the invention relates to an industrial process or a specific kind of machine. In fact, however, the question is not (and was never) whether a machine is in the picture. Rather, under the logic of *Diehr*, the question is whether the invention threatens to preempt laws of nature, as opposed to constituting the application of those laws in a specific manner to a specific industrial art.

Focusing on the presence or absence of a specific machine led the Federal Circuit to engage in remarkably strained logic. The *Alappat* court upheld the invention on the grounds that it related to a specific machine because the software allowed the computer to, in effect, become a machine with the specific purpose of being a machine that produced smooth lines on the display. 33 F.3d at 1544. This may sound circular and confused, and it is. Under *Alappat's* logic, *any* invention related to a computer automatically makes the computer a specific machine. *See, e.g., Rethinking Patent Law* at 119-20. Worse yet, the Circuit's decision implicitly endorsed the approach of patenting software by focusing on broad, vague notions of the result.

In the two decades that have followed, the consequence has been ever-broader result-oriented software patents granting huge swaths of territory to inventors with the potential to reach well beyond what the inventor actually accomplished up to that point. Consider, for example, a recent patent on a user interface. U.S. Patent No. 7,620,565 (filed Nov. 17, 2009). The patent claims a monitor, a memory, and a transmitter and a processor configured to: Monitor a product for a predefined "trigger event," increment a counter, cause the display of a user interface, and, if the counter exceeds a threshold, cause the memory to store an input received from the interface and cause the transmitter to transmit the input to a server. *Id.* at Sheet 23. The language in this patent is incredibly broad. It does not indicate how the patent holder actually accomplished all those steps, nor would it be limited to the path the patent holder has taken. Far from extreme, however, this language is standard in software patenting. Its broad, nonspecific wording can provide extraordinary reach without much of a knowledge contribution. That problem is precisely what this Court warned against in the *Prometheus* case on patentable subject matter when it expressed concern about "conventional steps specified at a high level of generality." 132 S. Ct. at 1289. With software patents, the entire explanation of the patent may be little more than just that: Generality at the highest level.

Allowing simple prose to describe what a computer is accomplishing, rather than requiring identification with specificity of the programming innovations which create that result, contravenes one of this Court's first principles and is, plainly, nonsensical. *Prometheus*, 132 S. Ct. at 1294 (patent eligibility must not "depend simply on the draftsman's art"). This approach would never be permitted in areas outside software and its cousin business method patents. It is the legacy of our societal aversion to math and the Federal Circuit's misinterpretation of this Court's precedents.

B. REFOCUSING SECTION 101'S ANALYSIS ON PREEMPTION IS CRUCIAL IN LIGHT OF MODERN STRATEGIC BEHAVIOR IN PATENTING

In the modern world of patent monetization and patent wars, the notion of preemption takes on particular importance. Entire industries have exploded onto the scene in which entities buy up patents to assert them against any product that might conceivably have a relation to the patent – no matter how tangential. This practice has opened a Pandora's box of strategic behavior, in which companies spend an increasing amount of their time and resources defending, asserting, and strategizing about patents.[6]

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[6] *See, e.g.*, Robin Feldman, et al., *The America Invents Act 500 Expanded: Effects of Patent Monetization Entities* (forthcoming UCLA J. L. & Tech. 2014) (cited in the White House report on patent assertion) (reporting the result of an empirical study of all patent litigation over 4 years examining 13,000 patent lawsuits involving 30,000 patent assertions; the study documents the rise in monetization lawsuits and demonstrates, in particular, that as of 2012, a majority of patent lawsuits are now filed by monetizers), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2247195; Robin Feldman, *Patent Demands & Startup Companies: The View from the Venture Capital Community*, U.C. Hastings Research Paper No. 75 (Oct. 28, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2346338 (cited in House and Senate hearings on patent assertion in fall 2013 and concluding, among other things, that the majority of venture capitalists do not consider the potential for selling patents to NPEs when they decide whether to invest in a company, and that venture capitalists and startups do not see this activity in general as positive for the startup community); *see also* Colleen V. Chien, White Paper for Open Technology

(Continued on following page)

In an intense bargaining environment, courts must set rules that limit the possible roaming space for a patent holder. With certain types of patents, so few things are likely to survive close scrutiny, and the bargaining power that can be wielded with them is so great, that it may be better to forbid patenting them altogether. This is particularly true in light of the fact that much of the patent bargaining takes place privately, beyond the reach of the courts. Figures from the White House report on Patent Assertion suggest that the vast majority of patent demands never proceed to a lawsuit.[7] The potential for overreaching with certain types of patents suggests that those areas should remain outside the patent system. One can think of this as roughly analogous to *per se* rules in antitrust law. Given that so few examples are likely to be legitimate and the potential damage is likely to be so great, we choose to eliminate the category entirely.

The need for limitations may be particularly acute in the realm of process patents, of which software patents are a key segment. Patents are generally divided into two types: product and process patents.

Institute, *Patent Assertion and Startup Innovation*, New America Foundation (2013) at 20, *available at* http://ssrn.com/abstract=2321340 and Colleen Chien, *Startups and Patent Trolls* (forthcoming Stanford Tech. L. Rev.), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2146251; James E. Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 Cornell L.Rev. (forthcoming 2014).

[7] Exec. Office of the President, *Patent Assertion and U.S. Innovation* (June 2013) at 6.

In very general terms, product patents are granted on a particular device or machine, while process patents are granted on a method of doing something. When patent language identifies the boundaries of an invention that constitutes a device or a substance, that language is an abstraction of something concrete. When patent language identifies the boundaries of an invention that constitutes a way of doing something, that language may be an abstraction of an abstraction. The need for warning signals is particularly great when the discussion is quite far removed from anything we can contemplate in concrete terms. To cabin the bargaining, it is important to choose default rules to push back the possible roaming space and prevent patent holders from preempting areas that should be available to all.

II. THIS CASE PRESENTS A UNIQUE OPPORTUNITY TO CREATE COHESION ON THE ISSUE OF SUBJECT MATTER PATENTABILITY ACROSS ALL FIELDS OF INNOVATION

In a series of patent cases over the last few years – first business method patents, then medical diagnostics, then gene patents, now software patents – the Court has been considering the categories of invention that properly fall within the subject matter of a patent. *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); *Prometheus*, 132 S. Ct. 1289 (2012); *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (June 13, 2013). As this series suggests, these are related categories that have become intertwined in illogical ways. The morass across recent years in patentable subject matter lies at the tangled intersection of computer technology, life sciences, financial services, and the Internet. In the decades since *Alappat*, the lower courts have struggled to develop a test that will allow patenting of computer-related innovations in a logical manner, one that can also be applied rationally in other emerging areas. One after another, the lower court tests have failed, because the courts were increasingly trying to justify – and create doctrine for – inventions that were outside patentable subject matter. The case at hand presents a unique opportunity to harmonize the law across all of these areas which, at the moment, remains logically incoherent.

The Gordian knot centers on patents related to methods of doing things. Following on the heels of the Federal Circuit's approval of software patents in *Alappat*, the Circuit turned four years later to the question of business method patents. These lower court cases arose decades after the Court's decisions in *Flook* and *Diehr*, during which time the lower courts had strayed far from the underlying logic of these cases.

In particular, for much of the 20th century, courts had excluded methods of doing business from the list of patentable subject matter. In 1998, however, the Federal Circuit upheld business methods as a legitimate subject for patents in the *State Street Bank* case, finding that prior cases had rested on concerns unrelated to patentable subject matter. *State Street Bank & Trust Co. v. Signature Fin. Group Inc.*, 149 F.3d 1368 (Fed. Cir. 1998). Extending its misinterpretation of this Court's precedents, the Federal Circuit upheld the same approach for business method patents that it had for software, allowing patenting of business methods described only in abstract terms of the result accomplished, and at a high level of generality.

The patent the Federal Circuit upheld in *State Street* concerned a computerized hub and spoke accounting system for structuring mutual fund investments, but many business method patents granted in the subsequent years covered far less sophisticated inventions. These included a method of teaching janitors how to vacuum, and a method of making toilet reservations for airplane travelers. *See* U.S. Patent No. 5,851,117 (filed Apr. 23, 1997), and U.S. Patent No. 6,329,919 (filed Aug. 14, 1999), respectively. As one dissenting judge noted, "[p]atents granted in the wake of *State Street* have ranged from the somewhat ridiculous to the truly absurd . . . producing a thunderous chorus of criticism." *In re Bilski*, 545 F.3d 959, 1004 (Fed. Cir. 2008) (Mayer, J., dissenting).

The questions of whether and how to limit business method patents, however, implicate numerous other areas of invention. Business methods are essentially ways of going about doing something. Language that might limit business method patents, therefore, might also be applied to patents on computer software, which may be expressed in terms of ways of going about getting a machine to do something. Limitations on business methods might also implicate diagnostic and therapeutic patents in the biotechnology space, which may be expressed as methods of diagnosis and treatment by doing something. Such limitations could also implicate patents on things like genes and antibodies, which are a strange combination of a product and a method of going about doing something. Human genes are literally a sequence of nucleotides that operate as a set of instructions for carrying out some function in the human body. Normally, a set of instructions is considered a process, rather than a product but, once again, genes are as tangible as any product one might create.

It takes a certain amount of mental gymnastics to contemplate a thing whose nature combines both product and process. If one could create an instruction manual that operated on its own, for example, would it be a process or a product? One could argue that software, to some extent, is an example of another hybrid of this kind. Software itself could be thought of as a set of instructions. It is a set of instructions, however, that is designed to operate itself, to produce a set of results. The overlap between product and process patents for inventions such as software highlight the importance of creating coherence in this area, to avoid the type of clever draftsmanship the Court has warned about.

In cases following *State Street*, the lower courts struggled to establish a test for patentable subject matter that could successfully navigate all of these areas.[8] The Federal Circuit considered a "physical transformation" test, then tried out a "useful, concrete, and tangible" test and, finally, moved on to the "machine or transformation test" as the sole method for determining patentable subject matter, with none of these capable of addressing the issues in a consistent and comprehensive manner.[9]

Problems with the Federal Circuit's application of the "machine or transformation test" in the context of software cases are illustrative. Finding a machine or transformation is not the goal of patentable subject matter. As this Court has noted, nothing in the ordinary meaning of Section 101's terms "would require them either to be tied to a machine or to transform an article." *Bilski*, 130 U.S. at 3234. Rather, the test is a possible proxy for ensuring that the subject matter of the patent at hand does not pose preemption problems. It is not that everything embodied in the proxy is wrong; the danger with "the machine or transformation test" is that one can forget what the proxies are testing for and allow the proxies to take on a life of their own. That is precisely what has happened with software. The Circuit has applied the test in a literalist manner that loses sight of the underlying logic. As described above with the patent related to causing a computer display to show a smooth line, the Circuit's *Alappat* decision created a test in which any software patent would survive when a machine is involved.

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[8] For a detailed discussion of examples within the Federal Circuit's jurisprudence, *see Rethinking Patent Law* at 89.

[9] The lower courts' approach can best be characterized as "death by tinkering," changing a little piece here and a little piece there until the entire doctrinal area threatens to collapse of its own weight. The cases make distinctions to reach a particular result, but the rules (and the distinctions within those rules) lack general applicability and defensible logic. The approach is both intellectually and operationally unsatisfying.

The Circuit's vision of the transformation prong of the "machine or transformation test" has suffered from similar problems. For example, in dicta in the *Bilski* business methods case, which this Court subsequently overturned, the Federal Circuit explained that CAT Scan data would satisfy the transformation test because data representing bones, organs, and other body tissues were transformed. *In re Bilski*, 545 F.3d at 969. This example is difficult to comprehend. The act of displaying CAT Scan data on a screen bears little resemblance to a chemical process or a process that physically transforms raw materials.

Alternatively, one might think, from the CAT Scan example, that the Circuit is really asking whether input data represent something physical. In other words, it is not about whether something physical is changed in a physical sense. Rather, it is simply about whether input data that started out representing something physical are "transformed" into a different state. From that perspective, the Federal Circuit might have intended to limit computer-related technology only to those programs that create data representations of physical items. This approach seems to be the best way to make sense of the idea that CAT Scan data satisfy the transformation test. Such a distinction, however, would not be very helpful as a demarcation line. One can argue that almost any data represent something physical in some way. For example, one would think that interest rates and carbon credits are abstractions rather than physical items. Interest rates, however, represent cash payments of dollar bills, and carbon credits represent volumes of carbon that are not emitted into the atmosphere. Just about anything could arguably satisfy a test this broad. *See* Bruce Alberts et al., *Molecular Biology of the Cell* (4d ed. 2002) at 1358.

Undoubtedly, computer programs are similar to things that are intangible and abstract. Performing a series of steps on data is certainly abstract. Attempting to circumvent the ethereal nature of computer programs by looking for evidence of something concrete in any corner of the activity, however, simply invites clever drafting and creative framing of the invention. These types of comparisons have led some courts to fixate on the presence of a machine in the invention. A machine for a specific purpose would seem to mollify those who would object that the invention is merely an abstraction or that it constitutes no more than human thought. Nonetheless, the presence of a machine may be totally irrelevant. If an invention is unpatentable because it is essentially human thought, one cannot save the invention by having a computer perform the task that a human ordinarily would. Thus, arguing over the presence or absence of a machine and the centrality of the machine to the invention is not helpful. What is helpful, however, is to return to the touchstone reason for removing certain categories from patentable subject matter in the first place: Preemption. The focus must be on the content of what is new in the invention, in other words, the inventive concept. *Prometheus*, 132 S. Ct. at 1289 (the Court's "precedents . . . insist that a process that focuses upon the use of a natural law also contain other elements or a combination of elements, sometimes referred to as an "inventive concept," sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself.").

III. FOR SOFTWARE AND BEYOND, THE UNIFYING, COHESIVE TEST FOR PATENTABLE SUBJECT MATTER LOOKS TO PREEMPTION AND TO SPECIFIC COMMERCIAL APPLICATION

A proper test for determining patentable subject matter, one that can be used across innovation generally, should focus both on preemption and on the tests for patentability as a whole. It can be expressed as follows: Considering the limitations of the patent system as a whole, is the subject matter of this patent likely to create preemption problems? The answer requires an analysis of preemption and specific commercial application. This latter element is required because, "as the Court has also made clear, to transform an unpatentable law of nature into a patent-eligible *application* of such a law, one must do more than simply state the law of nature while adding the words 'apply it.'" *Prometheus*, 132 S. Ct. at 1294 (emphasis in original).

There is no question that, for patents other than software, we require inventors to tell us not just the result, but how they actually got to that result. We then limit the territory granted by the patent to the specific path they invented. Only in software and business method patents do we allow inventors to aggregate to themselves a broad, abstract result. This disparate and inexplicable situation must be rectified to correct the lower court's misinterpretation of case law that has lead to the proliferation of patents in this form.[10]

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[10] The lower court's confusion on this point undoubtedly has been fueled by the similarity of facts in *Flook* and *Diehr*, notwithstanding that the expressions of the claims and the preemption risks diverged. Indeed, over time, scholars have noted that the facts in those two cases are uncomfortably similar. For example, the invention in *Flook* could be described as a process for updating the moment a catalytic conversion should end, using a computerized formula and a set of steps to constantly recalculate the relevant moment, based on a series of changing factors. Similarly, the invention in *Diehr* could be described as a process for updating the moment that rubber-curing should end, using a computerized formula and a set of steps to constantly recalculate the relevant moment, based on a series of changing factors. The lower court's difficulties in applying these cases to new inventions decades later might benefit from an acknowledgement that, to the extent these cases have been interpreted to suggest that a proper software patent is an abstract document

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Notably, part of the lower court's challenge in developing appropriate tests in this context may well have centered on confusion about the application of the term "algorithm" to software. The term first appeared in the Court's jurisprudence as early as 1972 (*Benson,* 409 U.S. at 65), but it has come to have specific meaning in the software field, and one that has created major difficulties. In the context of computer software, defining what constitutes an algorithm is hardly clear. An algorithm at its broadest sense is any sequence of steps taken to produce a result. That definition would, however, cover just about everything that receives a process patent. In the field of computer science, the term "algorithm," again in its broadest sense, refers to a series of steps that a computer performs on input data. In a narrow sense, the study of algorithms in computer science often describes a theoretical area of the field in which sets of operations are formalized in mathematical notations.

If the exclusions from patentable subject matter include anything that can be understood as a set of steps formalized in mathematical notation, huge swaths of modern innovation would be eliminated from the patent system. These concerns may have encouraged patent holders and the lower courts to develop the current approach for software patents

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expressed at a high level of generality, the Court had no such intent.

of focusing on the result of the invention, rather than the steps taken to get there.

We now know that, while digital languages are typically represented by mathematical characters, they are quite different from an algorithm or mathematical formula that expresses a law of nature. Indeed, there are many different digital languages (*e.g.*, C++, VB.NET, HTML, Python, Assembly), and software programming has advanced to its fourth generation. Unlike the patent in *Benson*, modern software programs are no longer comprised of pure machine code, that is just ones and zeros, but use mnemonic codes such as LDA for load and STA for store making the code easier to read and write.[11] Today, software is commonly understood to be a means of expression or communication, and one would be hard-pressed to say that all software is, categorically, nonstatutory. The focus should remain on the content of what is being expressed and the preemptive effect that might result from patenting that type of content.

Thus, an "algorithm" in computer science – a series of steps performed on input data by a computer – may or may not raise preemption concerns. Some computer "algorithms" are based on properties inherent in types of input and output data. Such broad, generic algorithms, which can be used on a variety of types of input data, may raise threats of preemption. In other words, in light of the bargaining potential that would come with such a grant, the patent would risk tying up entire types of data rather than constituting something applied. This does not mean, however, that all software is unpatentable. Claims to programs that are applied to a *specific* type of data in the pursuit of *particular* types of outputs do not present the same level of preemption threat.[12]

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[11] *Fundamentals of Computer Systems: Generations of programming language*, WikiBooks: Open Books for an Open World (updated Sept. 23, 2013), available at http://en.wikibooks.org/wiki/Alevel_Computing/AQA/Computer_Components_The_Stored_Program_Concept_and_the_Internet/Fundamentals_of_Computer_Systems/Generations_of_programming_language.

Consider the following hypothetical example of a software invention that would meet the test of commercial application specificity. Suppose a software program is invented to assess how risky someone is for car insurance underwriting. The inventive concept relates to ways to assess risk related to information on how much a person texts while driving. The idea that someone who sends a lot of text messages while driving is likely a distracted and risky driver is somewhat akin to a law of nature, if not an abstract concept. This specific method combines the frequency an individual sends text messages while driving with other indicators of that person's risk, such as credit history, hobbies, and driving history. These values are assigned different weights and multipliers to produce a risk score. As an additional twist on this approach, if the frequency of text messaging is above a certain level, the score indicates the person should be denied insurance. Otherwise, the frequency of text messaging while driving is weighted in the software program against other factors to produce a composite risk score, which is used in underwriting.

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[12] At its core, this is the distinction the Court identified in reaching opposite conclusions in *Flook* and *Diehr*. The Court's decisions in these two cases can be characterized as focusing on whether the inventor was trying to claim a type of computer program in general, rather than a specific application and a specific way to apply the type of program.

In contrast to current software patenting, in which this program would simply describe the invention in these abstract terms, a proper software patent would begin by including the precise combination used to produce the risk score and the software language to accomplish it. The scope of the patent would be limited to the inputs used, the path chosen, and the method of combining the inputs to reach the result for determining this type of underwriting risk. The patent would not, for example, be able to claim broadly all software and all risk assessment methods that use one factor as a floor before other factors might be weighed in. Nor would the patent be able to control other combinations of inputs for assessing driving risk.

Requiring such specificity helps to ensure that the patent does not preempt the natural phenomenon that one who texts and drives is risky, nor blocks all routes for assessing that characteristic. Rather, the patent holder receives territory commensurate with the inventive concept contributed – assuming, of course, that the core of the inventive concept meets the other elements of patentability, such as the requirements that the approach is new and would not be obvious to those skilled in the art.

This notion of specific commercial application is not akin to field of use limitations, which the Court has rejected in the past. As the Court has noted, all patents involve laws of nature to some degree, and one cannot solve preemption problems simply by claiming, for example, the law of gravity limited to the field of building bridges.[13] Identifying the field does not help the preemption problem. In contrast, testing for specific commercial application ensures that a patent covers an application of a law of nature – rather than the law itself – and that the patent meets the constitutionally mandated standard of promoting the progress of the "useful arts."

In sum, the framework set forth herein for determining patentable subject matter under 35 U.S.C. § 101 is one that can be used in connection with the software-related issues presented in this case and across innovation generally, focusing on both preemption and the tests for patentability as a whole. It is predicated on this Court's precedent and the language and legislative history of the Patent Act.

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[13] *See, e.g., Prometheus*, 132 S. Ct. at 1293 ("[A]ll inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas."); *Bilski*, 130 S. Ct. at 3221 ("[T]he prohibition against patenting abstract ideas 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment' or adding 'insignificant postsolution activity' ") (quotation omitted).

IV. THE TEST OF PREEMPTION AND SPECIFIC COMMERCIAL APPLICATION FOLLOWS LOGICALLY FROM THE COURT'S EARLIEST TEACHINGS ON SUBJECT MATTER PATENTABILITY AND FINDS SUPPORT IN THE PATENT ACT ITSELF

In ascribing a broad scope to things that may be patented, courts and commentators often quote language from the 1952 Patent Act's legislative history stating that patents "may include anything under the sun that is made by man." *Diamond v. Chakrabarty*, 447 U.S. 309 (1980) (citing legislative language).[14] In fact, in context, the complete language suggests just the opposite. It reads: "A person may have 'invented' a machine or a manufacture, which may include anything under the sun that is made by man, but it is *not necessarily* patentable under section 101 unless the conditions of the title are fulfilled."[15] Thus, the full quote indicates not an expansive notion of patentable subject matter but, rather, a limitation on its reach. *In re Bilski*, 545 F.3d at 1000 (Mayer, J., dissenting) (noting that, although the quote is used to suggest that Congress intended anything under the sun to be patentable, the legislative history says no such thing).

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[14] For example, numerous cases, relying on the quote set forth in text above, have suggested that patentable subject matter is quite broad and that everything under the sun made by human beings is eligible for patent protection. *See, e.g., State Street Bank & Trust Co. v. Signature Fin. Group*, 149 F.3d 1373 (Fed. Cir. 1998), abrogated by *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc), aff'd sub nom. *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); *AT&T Corp. v. Excel Communs.*, 172 F.3d 1355 (Fed. Cir. 1999), abrogated by *In re Bilski*, 545 F.3d 943; *Ex parte Allen*, 2 U.S.P.Q.2d 1427 (B.P.A.I. 1987); *Ex parte Hibberd*, 227 U.S.P.Q. 444 (B.P.A.I. 1985).

United States patent law has traditionally excluded inventions that constitute laws of nature, abstract ideas, mental steps, and mathematical formulas from the list of things that are patent eligible, no matter how useful, insightful, ingenious, and revolutionary. This list of exclusions has developed as a matter of common law rather than statutory law.[16] The logic for these exclusions to patentable subject matter, however, can be understood from constitutional, historic, theoretic, and practical perspectives.

The constitutional language giving Congress the power to establish copyrights and patents authorizes

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[15] *See* S. Rep. No. 82-1979 (1952), p. 5, reprinted in 1952 U.S.C.C.A.N. 2399; H.R. Rep. No. 82-1923 (1952), p. 6, reprinted in 1952 U.S.C.C.A.N. 2399.

[16] Categories of proper subject matter are described in the Patent Act as including machines, compositions of matter, manufactures, and processes. 35 U.S.C. § 101. Categories excluded from proper subject matter are described in the courts as laws of nature, natural phenomena, mathematical formulas, mental steps, and abstract ideas. *Benson*, 409 U.S. at 67-68.

Congress "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors an exclusive Right to their respective Writings and Discoveries." U.S. Const. art. 1, § 8, cl. 8. Given the language of the time and parallel construction within the sentence, science, authors, and writings are interpreted as applying to copyright, while useful arts, inventors, and discoveries are interpreted as applying to patents.

As this Court has noted, the constitutional clause serves both as a grant of power and a limitation on it. *See Graham v. John Deere Co. of Kansas City,* 383 U.S. 5 (1966) (discussing the constitutional language and noting that the clause is both a grant of power and a limitation). Congress's power is limited to those acts that will promote progress, reflecting the distinctly utilitarian approach in this country. Patents are limited to the useful arts, and the grant must be for limited times. Finally, the notion of granting rights to inventors for "their respective . . . Discoveries," can (and perhaps should) be read as a limitation granting rights only to those things inventors can show truly should be deemed *theirs*. *E.g.*, *Feist Publ'n Inc. v. Rural Tel. Serv. Co. Inc.*, 499 U.S. 347 (1991) (ruling that telephone numbers do not meet the constitutional requirements for copyright protection).[17]

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[17] A number of authors argue in favor of the general proposition that the constitutional clause on the whole or other parts

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These constitutional limitations provide the backdrop for the historic, theoretic, and practical considerations that have led to the common law exception to patentable subject matter. The notion that proper subject matter for patents excludes laws of nature and abstract principles has deep roots in the United States common law system. For more than 150 years, this Court has held that abstract ideas and laws of nature cannot be patented, reflecting a separation between the notion of *applied* science and *basic* science. General ideas, or basic science and research, are not the subject of patent protection. Only applied ideas are eligible to receive the patent bounty. As the Court explained in one of the earliest cases to address the issue:

> A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as none can claim on either of them an exclusive right. . . . The same may be said of electricity, and any other power in nature, which is alike open to all, and may be applied to useful purposes by the use of machinery. . . . The elements of the power

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can be read as a limitation. *See, e.g.*, Dotan Oliar, "Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress's Intellectual Property Power," 94 *Georgetown Law Journal* 1771 (2006); Alan L. Durham, "'Useful Arts' in the Information Age," 1999 *Brigham Young University Law Review* 1424-30 (1999); Cynthia M. Ho, "Who Deserves the Patent Pot of Gold?: An Inquiry into the Proper Inventorship of Patient-Based Discoveries," 7 *DePaul Journal of Health Care Law* 240-42.

> exist; the invention is not in discovering them, but in applying them to useful objects.

Le Roy v. Tatham, 55 U.S. (14 How.) 174-75 (1852) (dicta in case concerning lead pipe); *see also O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1853) (finding "the discovery of a principle in natural philosophy or physical science is not patentable.").

This perspective finds constitutional support in two ways. First, the Constitution gives Congress the power to promote the progress of the useful arts, suggesting that the universe of patents should include those inventions that are of *practical use* to society rather than fundamental laws and abstractions.[18] Second, the constitutional grant of rights to "their" (i.e., the inventors') innovations *excludes* abstractions, mathematical formulas, and the like because they are an invention of nature, not of humans.[19]

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[18] As one jurist has noted, "There is little evidence in the historical record about what is meant by the 'useful arts,' but it appears intended to refer to 'arts' used in industry and the production of goods." *Ex parte Bilski and Warsaw*, No. 2002-2257, 2006 Pat. App. LEXIS 51, *12-13 (B.P.A.I. Sept. 26, 2006).

[19] This difference echoes another historic distinction in U.S. patent law. At one time, British patent law rewarded not just the act of creation but also the act of rendering information accessible to British society. Importers and inventors, for example, were once treated the same under English patent law on the theory that information first brought to British society was as valuable as new inventions. *See* William C. Robinson, *The Law of Patents for Useful Inventions* (Little, Brown 1890) at 105 & n.2; 104 n.1 (describing the English case, *Edgebury v. Stephens*, 2 Salk. 447 (1691), for the proposition that "whether learned by

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The distinction between the discovery of basic laws of nature, which are outside the subject matter of patent law, and the application of laws of nature, which are within patentable subject matter, has echoed consistently and strongly in this Court's teachings. In 1853, for example, the Court rejected a claim from the inventor of the telegraph that would have covered all uses of "electromagnetism, however developed, for marking or printing intelligible characters, signs, or letters, at any distances." *O'Reilly*, 56 U.S. (15 How.) at 113. In denying patentability, the Court noted presciently:

> For aught that we now know some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current, without using any part of the process or combination set forth in the plaintiff's specification. . . . [T]he inventor could not use it, nor the public have the benefit of it, without the permission of this patentee. . . . Nor is this all, while he shuts the door against inventions of other persons, the patentee would be able to avail himself of new discoveries in the properties and powers

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travel or by study it is the same thing"). The United States, however, has always focused on the notion of original creation rather than the notion of rendering information accessible. The distinction between introducing information and original creation has played out in the development of categories excluded from patentable invention under United States law.

> of electro-magnetism which scientific men [and women] might bring to light.

Id.

Some 100 years later, the Court reiterated these points in the *Funk Bros. Seed* case in 1948:

> He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be an invention from such a discovery, *it must come from the application of the law of nature to a new and useful end.*

Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130 (1948) (emphasis added).[20]

The Court explained that "patents cannot issue for the discovery of phenomena of nature" because such phenomena "are part of the storehouse of knowledge of all men. They are manifestations of laws of nature, free to all men and reserved exclusively to none." *Kalo*, 333 U.S. at 130 (citation omitted) (quoted in *Diamond v. Chakrabarty*, 44 U.S. at 309).

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[20] *See also Diamond*, 450 U.S. at 187-88 (noting that the invention is patentable because it applies laws of nature to a specific application); *Mackay Radio & Tel. Co. v. Radio Corp. of America*, 306 U.S. 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not [a] patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."); *In re Alappat*, 33 F.3d at 1542-43 (arguing that when an abstract concept has no claimed practical application, it is not patentable); Robinson, *Law of Patents*, at 116 (noting that an unapplied idea is not an invention).

Allowing one inventor to capture these elements would hamper innovation and block further developments in a number of fields. Thus, as this Court has made clear, the patent system sequesters the raw materials of invention, thereby ensuring access for all current and future inventors.

As demonstrated herein, the touchstone for faithfulness to these concepts is preemption. Patentability should not be permitted for patents whose subject matter threatens to block out natural laws or natural phenomena. In misinterpreting this Court's precedents, the lower courts have opened the door to decades of patents whose very form raises preemption concerns. Such patents focus on the result of the invention, rather than the steps taken to get there, an approach unheard of for other types of patenting. Moreover, such abstract patenting fails to ensure that the invention, and its core inventive concept specifically, constitute a commercial application of the laws of nature. Refocusing the inquiry on the core concepts of preemption and specific commercial application can bring logical coherence to patentable subject matter, holding software patents to the same rigorous standards required for patenting of all kinds.

CONCLUSION

Amici respectfully ask the Court to consider the framework for analyzing patentability set forth herein as a cohesive means of addressing both software and the broader issue of patentable subject matter in general under 35 U.S.C. § 101.

Respectfully submitted,

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AMICUS
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IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

BRIEF OF BRIAN R. GALVIN AS *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY

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INTEREST OF *AMICUS CURIAE*[1]

Brian R. Galvin respectfully submits this *amicus curiae* brief in support of the petitioner Alice Corporation.

Amicus has been deeply involved with United States patent law over the past twenty years, particularly as related to software-related inventions, in various capacities. In the past, he has been Chief Technology Officer of two large software companies, and Chief Executive Officer of one small technology company. He is the inventor of fifteen issued United States patents, and has more than a dozen pending patent applications—all of which are in some way software-related. Currently he practices patent law full-time as a registered patent agent, with one large software company and numerous small software companies as clients. He also provides litigation consulting in patent-related matters, generally on the defense (accused infringer) side, and he has been involved as both plaintiff and defendant in patent litigation during his technology career.

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[1] Petitioners consented to the filing of amicus curiae briefs in support of either party or neither party in a docket entry dated December 11, 2013, and Respondents consented to this filing in a docket entry dated December 11, 2013. Pursuant to Sup. Ct. R. 37.6, no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. In fact, no person made a monetary contribution to its preparation or submission. This brief was authored by Brian R. Galvin solely, and reviewed by counsel prior to filing.

SUMMARY OF ARGUMENT

The bewildering state of patent eligibility jurisprudence under 35 USC §101[2] is unsurprising. Technology marches onward, and patent law has been slow to keep pace. Recent §101 cases have routinely cited a number of "warhorse" cases (e.g., *Benson, Flook, Diehr,* and *Chakrabarty*[3]), each of which in turn ultimately cites back to a small set of venerable cases from the nineteenth century—cases written during an era when technology was radically different than it is today. One result of this dynamic is the recent emergence of the "abstract idea exception" as one of three judicially-created exceptions to the otherwise plenary scope of §101 (that the emergence is recent will be shown below). But in fact there is no abstract idea exception in the older cases, and the exception exists today only because of careless citations to the older cases.

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[2] "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.", 35 USC §101

[3] *Gottschalk v. Benson,* 409 U.S. 63, 71-72, 93 S.Ct. 253, 257, 34 L.Ed.2d 273 (1972); *Parker v. Flook,* 437 U.S. 584, 594, 98 S.Ct. 2522, 2527, 57 L.Ed.2d 451 (1978); *Diamond v. Diehr,* 450 U.S. 175, 182, 101 S.Ct. 1048, 67 L.Ed.2d 155; *Diamond v. Chakrabarty,* 447 U.S. 303, 308, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980).

The perennial issues of §101 can be much more easily dealt with if we start with the statute and then only go further if we need to (which will prove to be unnecessary). As will be argued in detail, there is no need for an abstract idea exception to §101; the key is reinvigorating the utility element of §101. A purely abstract idea would not be "useful"; an abstract idea embodied in a computer (whether in firmware, or in downloaded software, or however "in" a computer) would have a presumption of utility that could be overcome by litigants by showing that the computer so configured does not in fact have a use. A computer embodying an abstract idea should be presumed useful, and the analysis would then move on to whether it is novel (§102) and nonobvious (§103). But the same abstract idea would not itself be patented; one could use it in research, or could use it in a mathematical proof, or do whatever one wants, *except* using it in a computer configured in such a way as to infringe any patent being considered. This approach is statutorily correct and gives full scope to Congress' plainly stated plenary scope for §101 (i.e., "*any*" means what it says).

Moreover, the "physical phenomenon" and "law of nature" exceptions, which definitely *do* exist in the case law and which have sound policy reasons, can be shown to be perfectly logical outcomes of a proper statutory interpretation exercise (and thus a reflection of what Congress intends, not requiring judicial creation[4]). That is, physical phenomena and natural laws are by definition not "new", so they can be excluded simply based on §101 (which states that patents *shall* be granted to "any new and *useful* manufacture...or process"). Further, it will be shown that the venerable cases (specifically *Morse, Le Roy v. Tatham, Funk Bros.*, and *Rubber-Tipped Pencil*[5]) can each be understood without reference to any underlying abstract idea exception.

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[4] *Amicus* acknowledges that the exceptions were stated first in judicial pronouncements, but they are and always have been consistent with a proper reading of §101, which has used the word "any" since 1793. Thus *Morse* for example did not go beyond Congress' stated intent, since claiming so broadly as to in effect patent the use of electromagnetic force to transmit a

Benson and *Flook* will be discussed in detail, in order to argue that they were incorrectly decided, and to suggest that the Court might consider overturning them in order to establish a solid, clear, statutorily-grounded §101 understanding. With this understanding in mind, resolution of this case (and

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signal (which Nature has done throughout time) would be claiming something *by definition not new*.

[5] *O'Reilly v. Morse*, 15 How., at 113, 14 L.Ed. 601; *Le Roy v. Tatham*, 14 How. 156, 174, 14 L.Ed. 367; *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130, 68 S.Ct. 440, 92 L.Ed. 588 (1948); *Rubber-Tip Pencil Co. v. Howard*, 20 Wall. 498, 507, 22 L.Ed. 410 (1874).

of *WildTangent*, for which certiorari is being sought[6]) will be straightforward.

Finally, *amicus* notes that this case is of extreme importance to the United States economy. A very large portion of the value of American companies stems directly from intangible intellectual property. Some of it is of course implicated by trademark and copyright law, and need not concern us here. But the markets value American companies who primarily innovate in information technology—and predominantly in software—at well over a trillion dollars (e.g., Apple, Google, Microsoft, Yahoo!, IBM, Facebook, LinkedIn, etc.—none of whom contributed to this brief in any way). There is a strong upwelling of well-funded groups arguing that, "software should not be patentable" and that, "software patents stifle rather than promote innovation". *Amicus* believes these groups are mostly driven by interest (which of course is the American way), but notes that many of the arguments used are specious (for example, equating short-term stock price motions after a patent lawsuit is announced to value destruction, while neglecting any subsequent rebound). In any case, while abuse of patent litigation is clearly a matter susceptible to management by the courts, and this Court most of all, the delicate balance between "promoting the Progress" and "stifling innovation" is clearly a matter for the political branches, and *amicus* urges the Court to avoid the temptation to shift that balance by further constraining the reach of patent eligibility under §101.

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[6] and with whom *amicus* has no relationship; WildTangent, Inc., Petitioner v. Ultramercial, LLC, et al., Case No. 13-255, Cert. Petition Pending.

ARGUMENT

This is understood by all to be an important case. The potential economic impact of this case was discussed above. But as importantly, this case highlights an area of the law where inadvertence and the passage of time have led a significant legal issue astray. And this case is a good opportunity for the Court to set things back on track.

Recent §101 Cases Have Drifted From What Precedent Demands

The power of *stare decisis* being what it is, all of the briefs in this case, as indeed all recent Court pronouncements regarding §101 issues, have repeated the same litany of cases standing for the notion that, while Congress intended patent eligibility under the threshold test of §101 to encompass "anything under the Sun made by man", there are three judicially created exceptions. These are the well-known law of nature exception (going back to *Morse*), the physical phenomenon exception (going back really to *Boult v. Watt*), and the abstract idea exception (which seems to have emerged from *Rubber-Tip Pencil*). Of these three exceptions, it is the abstract idea exception that concerns us in this case. Briefs for both parties, as well as the flurry of recent Federal Circuit opinions (described in detail in many of the *amicus* and party briefs), and all recent Supreme Court and Federal Circuit cases dealing with software patents (e.g., *Bilski*; many more are discussed in the various briefs and will not be elaborated here) start by citing *Benson*, *Flook*, and *Diehr*, and then continue by trying to make sense of them. Moreover, the situation is even more confused because many commentators and attorneys conflate the "three exceptions" implicitly; for example, the holdings of *Mayo* are used to argue for how to handle the abstract idea exception, even though *Mayo* dealt only with the natural phenomenon issue. Two key questions immediately present themselves: (a) where did these exceptions come from, and (b) are they three peas in a pod, or are there differences in how one should treat them?

Turning first to the history of the purported abstract idea exception, it is clear that all roads lead to *Benson* (both parties cite to *Benson* via *Bilski*, *Diehr*, and *Flook*, as indeed the Court cited to Benson via *Diehr* and *Flook* in *Bilski*). The key paragraph in *Benson* that introduced so much disruption into modern patent law states:

"The Court stated in *MacKay* [citations omitted for clarity] that '(w)hile a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.' That statement followed the long-standing rule that '(a)n idea of itself is not patentable.' *Rubber-Tip*

Pencil. 'A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right' *Le Roy v. Tatham*. Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work. As we stated in *Funk Bros. Seed Co.*, 'He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end.'[7]"

This is the core of the abstract idea exception's running amok. Before turning to the cases cited there in the next section, it is helpful to consider that, because of the number of recent cases citing to the same authorities (ultimately the "big three" of *Benson*, *Flook*, and *Diehr*), the statements made in these cases have tended to be cited unquestioningly, and the result is that any error in *Benson* has by now permeated the literature of patent law, as evidenced by the fact that all sides in any §101 dispute (and especially those involving software) start by citing *Bilski* and the big three and the "well-known law" they seem to represent. Note also that the cited passage of *Benson* conflates natural phenomena, laws of nature (and their mathematical representation), and "abstract ideas", which conflation is common in §101 discussions. For example, *Mayo* is cited in the cert-stage briefs in this case, even though *Mayo* was *only* about natural phenomena. Is it appropriate to conflate these three issues? No. The reason why stems from the proper interpretation of §101, which is discussed below.

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[7] *Gottschalk v. Benson*, 409 U.S. 63, 67-68, 93 S. Ct. 253, 255, 34 L. Ed. 2d 273 (1972).

The Venerable §101 Cases Have Routinely Been Misconstrued—There Is No Abstract Idea Exception

Turning now to the cases cited in *Benson*, we will see that the cases do not support the points in *Benson* for which they were relied upon. The first case, *MacKay Radio*[8], deals with directional radio antennas, and with the natural phenomena exception (which is clear in the case law). Specifically, *MacKay Radio* states that, while knowledge of the Abraham formula governing how radio waves vary based on the geometry of antennas is not itself patentable, a novel type of antenna that leverages the Abraham formula to achieve a new and useful end (highly directional radio wave transmission) may be (and in fact was).

Rubber-Tip Pencil concerns an invention that today is an everyday item (at least for school children)—the removable rubber eraser that one can place on the end of a pencil. Arguably the case was poorly decided, since the majority in *Rubber-Tip Pencil* recomposed the claimed invention into its constituent parts, declared that each of them was well-known (even though no one had ever made such erasers before), and then said "What, therefore, is left for this patentee but the idea that if a pencil is inserted into a cavity in a piece of rubber smaller than itself the rubber will attach itself to the pencil, and when so attached become convenient for use as an eraser?"[9] Then, in the final paragraph of the opinion, the author states, "An idea of itself is not patentable, but a new device by which it may be made practically useful is. The idea of this patentee was a good one, but his device to give it effect, though useful, was not new. Consequently he took nothing by his patent".

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[8] Mackay Co. v. Radio Corp., 306 U.S. 86, 94, 59 S.Ct. 427, 431, 83 L.Ed. 506

The opinion, earlier, went to some length to disparage the novelty of each aspect of the invention. So this case was a case of *novelty*, and a poorly executed one at that (the claims as a whole were not examined for novelty, which would have revealed—based at least on the record available today—that in fact the combination of known elements was in fact new, and it was explicitly stated that it was useful). In any case, the citation used in Benson actually works, but not for the purpose it was used for in Benson (as one of the litany of precedents supposedly establishing the abstract idea exception). *Rubber-Tip Pencil* states that, "an idea *of itself* is not patentable, but a new device by which it may be made practically useful is". This does not mean necessarily only that a *device* that makes an *idea* useful makes patentability possible; it means that an idea, by itself, is not patent-eligible (because ideas don't have any use when they are in our heads), but *anything that makes an idea useful may be*. We should not be trapped by the fact that, in 1874 when this opinion was written, the vast majority of patents (including those of Morse and Bell) were for mechanical devices with at most some modest involvement of electricity (as in the case of Morse and Bell). The field "electronics" didn't even exist then (in fact, the electron itself was not discovered until much later). So the fact that the word "a device" was used to render "an idea" patent-eligible merely reflects the time, and should never have led us down the path we have taken, where there is an implicit bias in patent law towards tangibility. The key word, and the key concept, in *Rubber-Tip Pencil* is not "abstract idea" (which was never used), but *useful*.

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[9] Rubber-Tip Pencil Co. v. Howard, 20 Wall. (87 U.S.) 498, 507, 22 L.Ed. 410.

Turning now to *Le Roy v. Tatham*, we note first that again it refers to a natural phenomenon, not an abstract idea. But the passage cited, which states, "That the discovery of a new principle is not patentable; but it must be embodied and brought into operation by machinery, so as to produce a new and useful result", again both suffers from its era-specific tangibility bias ("embodied", "machine"), but also emphasizes the correct issues ("new and useful", "operative"). That is, an invention, to be patent-eligible, must take a principle and make it operative to provide a new and useful result. But "operative" really just means "useful", for a useful invention either does something or is used to do something—it is operative. A proper reading of *Le Roy v. Tatham*, in view of the proper interpretation of §101 (discussed below), is only that a principle (a natural phenomenon or law of nature) must be made *useful* in some *new* way (the principle itself cannot be new, since Nature predates all patent law).

As an aside, it should be noted that not all "ideas" involve laws of nature or natural phenomena. One can readily create, for example, a completely new algorithm (assume for our purposes that no other person has previously developed the same algorithm, or one that would render it obvious); such an algorithm is neither a "principle" nor a "law of nature". And it is therefore undoubtedly new (since we stipulated that there was no prior art for our hypothetical). But, until it is rendered operable in some way, it is not *useful*—an idea, in my head (or anyone else's), is just that, and it is not useful. That is the point of *Le Roy v. Tatham*.

Finally, let us consider *Funk Bros.* as cited in *Benson*. This also applies to a law of nature (in this case, a newly-discovered law of nature), and states that the law of nature itself is unpatentable (because it is not new), but rather patentability "must come from the application of that law of nature to a *new* and *useful* end". This again comports with the text of §101—the law of nature itself preexists patent law and cannot be new. But a *new* and *useful* application of the law is deserving of a patent. The key here and with the law of nature/natural phenomena exceptions in general (which are in essence the same thing) is that the law/phenomenon itself *cannot be new* (since Nature predates patent law), so to achieve patentability one must develop some *new* (relative to the prior art, which of course includes the natural law/phenomenon *per se*) and *useful* application. But *useful* does not mean "embodied" or "material"—these are nineteenth century biases. The meaning of useful has not changed, but the march of technology means that the scope of what may be useful certainly has.

This examination—admittedly somewhat lengthy—of the cases cited by *Benson* show that the precedents *do not support the existence of a judicially created abstract idea exception*. It simply isn't there. It was created out of thin air in *Benson*.

§101 Amenable to Clear Interpretation

As hinted above, *amicus* believes the issues surrounding patent eligibility can be disposed of fully merely by properly construing §101 ("Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title") using standard canons of statutory construction. The phrase, "any new and useful process, machine..." means just what it says, and it has always meant that since 1793 (except "art" was changed to "process" in 1952). "Any" means "any", which means Congress has always intended patent eligibility to be liberally construed. This means the §101 threshold test should be *de minimis*, checking *only* to see if the claim in question applies to a machine, a manufacture, a process, or a composition of matter. The law of nature/natural phenomenon exception follows directly from "new"; the only question of novelty to be addressed using §101 is this elimination of things that are clearly only claims to a law of nature or to a natural phenomenon. The issue of "abstract ideas" does not warrant a judicially created doctrine, since an abstract idea by itself is not useful.

Perhaps the most useful outcome that could result from this case is for the Court to reinvigorate the

Utility Doctrine of §101, which is rarely used today but which would dispose of this case (in favor of the petitioner) readily. "Useful" should be construed to mean its plain meaning, that is, capable of doing something or being used to do something. An idea by itself can do no more than change a person's mental state (they could accept or reject the idea, or it could give them other ideas). But such "uses" would not comport with the Constitutional framework wherein patent law is to "Promote the Useful Arts". Copyright exists to protect expression, and patent law exists to protect new and useful inventions. It is the Constitutional order of things, and the will of Congress as expressed since 1793, that *any* new and useful machine, manufacture, process (or "art" before 1952), or composition of matter be given patent protection if it meets the other requirements of the statute.

A helpful example comes from the field where so much economic value is being created today—software engineering. An "abstract class" is a set of code that describes what all objects that belong to classes derived from the abstract class must be able to do, but which *does not specify how to implement* *and does not enable any of those functions.* A "real" class may be derived from an abstract class, and must provide detailed code for how each of the required capabilities of the abstract class will actually be implemented in the real class. Real classes can have instances created; abstract classes cannot. Real classes "do things"; abstract classes do not. This is similar to what the Utility Doctrine of §101 should require. An "idea" by itself does not do anything, and cannot satisfy the Utility Doctrine of §101. A new and useful application of an idea—whether embodied in a software process, a machine, or whatever—would pass §101 because it is useful—it can do something or be used to do something whereas the idea itself cannot. That is the end of §101; the analysis then shifts naturally to novelty, obviousness, and the rest of patent law.

Thus a reinvigorated Utility Doctrine of §101 would dispose of this case (and of WildTangent), would eliminate the problematic abstract idea exception, and would explain the natural law/phenomenon exception as in fact not an exception but a mandatory application of the Novelty Doctrine of

§101.

Benson and *Flook* Should Be Overturned

There is more wrong in *Benson* than its creation of a doctrine of an abstract idea exception based on poor reading of precedents. *Benson* also presents a preemption doctrine, stating that, since the only possible uses of the binary-coded-decimal conversion algorithm claimed was in computers, a claim to a computer would preempt all use of the algorithm and therefore in effect be a patent to an algorithm, which violates the abstract idea exception (which does not in fact exist). But it is plain that, if a person were to invent a physical widget whose only use was to straighten hair, then a patent to the invention would preempt all use of the widget, and thus the idea for the widget itself. There is no difference between the widget preempting the idea for the widget (because it preempts use of the widget in the only field where the widget can possibly be used) and the supposed preemption in *Benson* (where the idea of the BCD algorithm is preempted because the only use of the algorithm is in computers). *Benson* did not try to patent the idea itself; what *Benson* tried to patent was a method of programming a computer using the new algorithm, which *did not exist in Nature previously* (there are no natural BCD conversions known to man). There is nothing more or less objectionable about *Benson's* invention (assuming it was new and nonobvious in view of prior art) than there would be in our hypothetical widget example. Moreover, in the opinion in *Benson* the facts noted in support of the overall direction of the Court that the President's Commission on the Patent System felt that software shouldn't be patentable because "the Patent Office now cannot examine applications for programs because of a lack of a classification technique and the requisite search files..." and because, "it is noted that the creation of programs has undergone substantial and satisfactory growth in the absence of patent protection and that copyright protection for programs is presently available"[10]. These comments are often cited in the ongoing §101 debate, yet it is clear on the face of it that whether or not the PTO is "ready to examine" patent applications for a new technology has precisely zero to do with how courts should treat a case like *Benson*. Clearly it is the President's concern to ensure the PTO is properly equipped, and Congress' concern to ensure the patent laws are well drafted. These statements by the Court in *Benson* give the impression that the Court can or should consider reading the tea leaves when considering such cases to determine whether one decision or another will lead to more or less innovation (this is not irrelevant, as many argue today that software patents should be banned because they suppress rather than promote innovation). Clearly the Court's role is to take the law as it is, interpret the statutes using proper canons of statutory interpretation, and then leave it to Congress to act if action is needed (although in this case it likely isn't needed or even desirable; see below).

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[10] *Gottschalk v. Benson*, 409 U.S. 63, 72-73, 93 S. Ct. 253, 257-58, 34 L. Ed. 2d 273 (1972)

One consequence of the *recent* and *ill-conceived* abstract idea exception is that the inventions of *Benson* and *Flook* were found unpatentable (because of their abstractness) while that of *Diehr* was found patentable (because it did something tangible). This has gotten even worse as the Federal Circuit attempts to follow the guidance from this Court. It is true today that an application to a novel technique for efficiently computing displaying the Mandelbrot set (which is not tied to any physical thing) would be unpatentable as drawn to an abstract idea, while one that has the same level of inventiveness and technical depth but displays a heartbeat would be patent-eligible (because it is displaying the condition of a heart—a physical thing—and is thus not abstract). There is nothing useful in this, and much that is disruptive—the long and ongoing series of §101 disputes being only cases in point.

Amicus realizes neither party has suggested it, and that judicial economy argues against it, but as part of setting things aright in this very unsettled area of patent law, not only should §101 properly construed govern and the abstract idea exception be terminated, but the Court might consider overturning *Benson* and *Flook* as a consequence of this change.

CONCLUSION

Amicus urges the Court to eliminate the so-called abstract idea exception to §101, explicitly acknowledge that software *per se* may be patent-eligible if new and non-obvious, and that *Benson* and *Flook* are no longer binding precedent.

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ALICE CORPORATION PTY. LTD.,

PETITIONER,

v.

CLS BANK INTERNATIONAL, ET AL.,

RESPONDENTS.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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BRIEF OF GOOGLE INC., AMAZON.COM INC., AMERICAN ASSOCIATION OF ADVERTISING AGENCIES, DELL INC., FACEBOOK, INC., INTUIT INC., LINKEDIN CORP., NETFLIX, INC., RACKSPACE HOSTING, INC., VERIZON COMMUNICATIONS INC., AND ZYNGA INC. AS *AMICI CURIAE* IN SUPPORT OF RESPONDENTS

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INTEREST OF *AMICI CURIAE*[1]

Amici include companies and a trade association with members that are innovative leaders in a variety of high-technology fields, including online search, advertising, commerce, collaboration, social networking, gaming, open source software, web hosting, computing, and related products and services. Their products and services are used by everyday citizens, Wall Street investment firms, Fortune 500 companies, and the United States government. Having obtained a number of patents based on their own extensive research and development efforts, and having had to defend against claims of patent infringement, the *amici* companies and trade association members support a high-quality patent system that rewards rather than impedes innovation.

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[1] All parties have filed blanket consent letters with the Clerk. No counsel for any party authored this brief in whole or in part, and no person or entity, other than *amici* or their counsel, made a monetary contribution intended to fund the preparation or submission of this brief.

INTRODUCTION AND SUMMARY OF ARGUMENT

Patents that merely claim abstract ideas implemented on computers or over the Internet are invalid under 35 U.S.C. § 101. Such patents add nothing meaningful to the abstract idea. Instead, the significant work comes later, when others undertake the innovative task of developing specific applications. That is the work that may be eligible for patent protection; merely claiming computer implementation of an abstract idea—without reciting *how* to implement the idea with a computer—is not.

This brief focuses on three points. *First*, in determining whether a patent claims an unpatentable abstract idea or a patentable application of the idea, this Court has looked to the generality and breadth of a patent claim by asking whether it contains specific, inventive limitations apart from the idea itself. Under that test, patent claims that simply describe an abstract idea such as financial intermediation, and generically recite the use of conventional computer or other data processing equipment to carry out that idea, are not patentable. Instead, a claim must disclose and limit itself to a specific way of implementing the idea with a computer or computing system. This Court has already rejected the counter-arguments advanced by Alice, its *amici*, and the dissenting judges below.

Second, patent eligibility should generally be resolved as a matter of law at the outset of a case. Even though this "threshold" requirement performs an important "screening" function (*Mayo Collaborative Servs. v. Prometheus Labs. Inc.*, 132 S.

Ct. 1289, 1303 (2012)), some Federal Circuit judges recently imposed novel procedural roadblocks to a timely and fair adjudication of the question. They stated that patent eligibility should not generally be resolved at the pleading stage, and instead should await formal claim construction or other factual proceedings in most cases. Section 101 presents a question of law, however, and experience has shown that claim construction proceedings are generally not required for this purpose. The Federal Circuit also held that defendants must prove patent ineligibility by clear-and-convincing *evidence*—even though burdens of proof are irrelevant to questions of law. This Court should reject these procedural hurdles, which would negate Section 101's threshold screening function and render it toothless in most cases.

Third, rigorous and timely application of this Court's Section 101 jurisprudence is especially important in this context because abstract software patents have become a plague on computer-related industries. The software industry developed and flourished without abstract patents before changes in the Federal Circuit's jurisprudence led to a flood of them. Far from promoting innovation, abstract software patents have impaired it by granting exclusive rights over high-level ideas and thereby blocking others from undertaking the truly innovative task of developing specific applications. In light of the ever-growing use of computerized equipment in a wide variety of settings, abstract software patents would stifle innovation in an increasingly wide circle of industries.

ARGUMENT

I. A PATENT CLAIM MUST DISCLOSE AND LIMIT ITSELF TO A SPECIFIC WAY OF IMPLEMENTING AN ABSTRACT IDEA.

A. Only Specific, Inventive Applications Of An Idea Are Patentable.

An "abstract idea, law of nature, or mathematical formula" may not be patented, even if dressed up as a series of steps in the form of a "process." *Bilski v. Kappos*, 130 S. Ct. 3218, 3230–31 (2010); *see also Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013); *Mayo Collaborative Servs. v. Prometheus Labs. Inc.*, 132 S. Ct. 1289, 1297 (2012). An *application* of an abstract idea or natural law may be patentable. *See Mayo*, 132 S. Ct. at 1294. But to cross the line from an unpatentable abstract idea to a patentable application, a patent claim must "contain other elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the" unpatentable subject matter. *Id.*

In *Mayo*, this Court identified three main guideposts for determining whether, in substance, a patent claim amounts to significantly more than its underlying abstract idea: (1) adding conventional or obvious steps is insufficient to confer patentable subject matter, *see id.* at 1294, 1298, 1299; (2) adding general and non-specific steps that do not significantly limit the claim's scope is insufficient, *see id.* at 1300, 1302; and (3) limiting an idea to a particular technological environment is insufficient, *see id.* at 1294, 1297.

These criteria focus on the generality and breadth of a patent claim by requiring that it be sufficiently specific and limited to provide "practical assurance" that a claimed "process is more than a drafting effort designed to monopolize" an abstract idea. *Id.* at 1297. The *Mayo* analysis thereby ensures that a patent's relative contribution to human knowledge justifies the extent to which it forecloses the field. *See id.* at 1301–02; *Bilski*, 130 S. Ct. at 3230; *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 113 (1853).

Mayo governs the patent eligibility of all inventions, including computer-implemented ones. Because Congress "designed [Section 101] to encompass new and unforeseen inventions," its plain language treats all technologies alike. *See J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135 (2001). For that reason, *Mayo* itself relied on decisions of this Court holding that various computer-related inventions were not patentable subject matter. *See* 132 S. Ct. at 1293 (citing *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972); *Parker v. Flook*, 437 U.S. 584, 590 (1978)). As this Court explained, "patent law's general rules must govern inventive activity in many different fields of human endeavor." *Id.* at 1305.

B. Generic References To Computer Implementation Do Not Transform Unpatentable Ideas Into Patentable Applications.

Under *Bilski*, this is an easy case because Alice's idea of financial intermediation is indistinguishable from the idea of hedging risk that *Bilksi* held to be abstract and unpatentable.

1. *Bilski* invalidated patent claims that recited a series of steps for hedging risk, including, among other things: initiating a series of financial transactions between providers and consumers of a commodity; identifying market participants that have a counter-risk for the same commodity; and initiating a series of transactions between those market participants and the commodity provider. 130 S. Ct. at 3223–24. Alice's patent does the same thing with the abstract idea of financial intermediation. When read as a whole, the asserted claims simply divide the idea into its constituent parts: "(a) creating a debit and credit account for each party, (b) checking the account balances in the morning, (c) adjusting the account balances through the day, and (d) paying the parties at the end of the day if both parties have performed." Pet.App. 164a (Prost, J., dissenting from panel opinion).

As the plurality opinion below explained, those are the things that one would either necessarily or conventionally do in order to perform financial intermediation. Pet.App. 29a–31a. Because those steps do not add anything meaningful or inventive to the abstract idea of financial intermediation, they do not confer patent eligibility. Indeed, *Bilski* invalidated claims, like Alice's, that contained a number of limitations related to the performance of a financial transaction, and described the method in some detail, but added nothing inventive to an abstract idea or natural law. *See Bilski*, 130 S. Ct. at 3231 (invalidating claims that were limited to the energy markets and "instruct[ed] the use of well-known random analysis techniques to help establish some of the inputs into the equation"); *see also Mayo*, 132 S. Ct. at 1297–98, 1302 (invalidating claims that involved administration of a drug but added nothing inventive to a natural law).

Those claims, and others like them, do not warrant patent protection because they add nothing *inventive* to the unpatentable subject matter. "[T]he underlying functional concern . . . is a *relative* one: how much future innovation is foreclosed relative to the contribution of the inventor." *Mayo*, 132 S. Ct. at 1303.

The difference between this case and *Bilski* is that some of Alice's claims generically recite the use of conventional computer equipment in performing the claimed method. Claim 1, for example, recites a "computer . . . configured to" perform financial intermediation and a "data storage unit" containing software. Pet.App. 35a. Other claims refer vaguely to a "first party device" or "communications controller." *Id.* at 36a. As the plurality below explained, these references merely "recite a handful of computer components in generic, functional terms that would encompass any device capable of performing the same ubiquitous calculation, storage, and connectivity functions." *Id.* at 37a.

Because these claims do not recite a specific way of implementing financial intermediation with a computer or computing system, they pass *none* of the *Mayo* guideposts. The computer-implementation limitations are too general to confer patent eligibility; indeed, they impose no limit whatsoever on *how* a computer program or specialized hardware accomplishes the financial-intermediation function. Alice may well be right that the claims contemplate "a substantial and meaningful role for [a] computer," Pet. Br. 48, in the sense that a computer plays an important role in *any* computer-implemented method. But generic references to computer equipment—be it a general-purpose computer, storage unit, server, router, telephone, or any other term denoting conventional data storage or processing hardware—provide none of the specificity needed for an actual application of an abstract idea.

As their lack of specificity suggests, the claims set forth nothing inventive about how to implement the abstract idea of financial intermediation on a computer. The dissenting Federal Circuit judges found it important that the asserted claims cover computer equipment "specifically programed to solve a complex problem." Pet.App. 73a (Rader, C.J., concurring-in-part and dissenting-in-part). But the claims do not disclose or limit themselves to any specific (let alone inventive) implementation. To the extent that performing the claimed method on a computer would require a novel or complex program, the patent claims do not disclose or limit themselves to it. On the other hand, to the extent that programming a computer to satisfy the claim limitations requires only the ordinary knowledge of programmers, it adds nothing inventive.

As a result, Alice's insistence that the claims must be read as a whole, in light of all of their limitations, is correct but beside the point. Nothing in the asserted claims discloses or limits them to the use of any new software, hardware, or other implementation.

Alice is therefore forced to rely on the mere fact that its claims are performed on a computer. Pet. Br. 37–40. Indeed, Alice argues that computer-implemented inventions "rarely" if ever claim unpatentable subject matter. *Id.* at 19; *accord id.* at 36. As the third *Mayo* guidepost makes clear, however, claims that simply recite an abstract idea in a specific technological environment, such as a computerized environment, are not patentable. *See, e.g.*, *Mayo*, 132 S. Ct. at 1294, 1297; *Bilski*, 130 S. Ct. at 3231. Absent additional, significant limitations, the idea remains abstract within that environment.

Computer limitations are no different from other limitations in that regard. *See* p. 7–8, *supra*. Indeed, the invalid claim in *Benson* was limited to a computerized environment, and the invalid claims in *Flook* likewise covered an algorithm. *See Benson*, 409 U.S. at 65; *Flook*, 437 U.S. at 586. Like other limitations, therefore, computer limitations could make a claim eligible for patenting only if they: (i) added a significant, innovative aspect to an otherwise abstract idea; and (ii) were included in (and thereby limited) the claim. *See Mayo*, 132 S. Ct. at 1294, 1297; *Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1344–45 (Fed. Cir. 2013). The ubiquity of computers in modern life and commerce makes it especially important not to exempt computer-related inventions from the rules governing patent-eligibility of all other inventions.

2. The same analysis applies to all of the asserted claims. Although some have argued that the prohibition on patenting abstract ideas is limited to method claims, Section 101 draws no distinction between its treatment of methods and products. *See* 35 U.S.C. § 101. In *Benson*, therefore, this Court determined that "the same principle applies" to "product" and "process" claims. 409 U.S. at 67–68.

Treating all claims alike is necessary to prevent ready evasion of Section 101. A computer-implemented method can always be recast as a claim to: (i) a computer-readable medium (such as a disk) on which instructions for performing the method are stored; or (ii) a system capable of performing the method. Absent additional specificity, such claims are every bit as abstract as claims to the underlying method, and are thus unpatentable for the same reasons. As this Court has repeatedly held, Section 101's limitations are substantive, not formalistic, and thus cannot be evaded by the drafter's art. *See, e.g.*, *Mayo*, 132 S. Ct. at 1294; *Diamond v. Diehr*, 450 U.S. 175, 192 (1981); *Flook*, 437 U.S. at 590; *see also* Pet.App. 33a.

Of course, a novel storage medium or a novel method of saving a program to a storage medium might be patentable. But the routine and conventional act of embedding software in storage media adds no inventive concept to an otherwise unpatentable abstract idea. Nor does it impose any meaningful limitation on the claim, because software must be saved to a storage medium to be used for its intended purpose.

Similarly, the system claims' generic description of conventional computer equipment capable of performing Alice's method adds nothing meaningful to the method itself; it is just another way of describing the method. Indeed, "'every competent draftsman' knows how to cast method claims 'in machine system form.'" Pet.App. 36a–37a (quoting *In re Johnston*, 502 F.2d 765, 773 (C.C.P.A. 1974) (Rich, J., dissenting)). Thus, upholding any of Alice's claims would make Section 101 a dead letter by sanctioning obvious end-runs around its requirements for patentability.

C. This Court Should Reiterate That Its Recent Section 101 Decisions Mean What They Say.

The asserted claims' invalidity under this Court's precedents is further confirmed by the fact that Alice and its supporters have relied on a series of rationales this Court already rejected. *See* Pet.App. 160a (Prost, J., dissenting from panel opinion) (criticizing panel majority for "resist[ing] the Supreme Court's unanimous directive to apply the patentable subject matter test with more vigor"); *cf. Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1345 (Fed. Cir. 2013) (Lourie, J., concurring) (criticizing panel majority in similar case for not "follow[ing] the Supreme Court's most recent guidance regarding patent eligibility"), *petition for cert. filed sub nom. WildTangent Inc. v. Ultramercial LLC*, No. 13-255 (Aug. 23, 2013). Although this Court could give short shrift to their arguments for that reason, the Court should, instead, be especially clear and specific in rejecting those arguments once again.

1. Section 101's Substantive Limitation On Patentability Cannot Be Evaded By Clever Drafting And Is Not Coextensive With Other Limitations On Patent Protection.

The primary debate within the Federal Circuit has been whether Section 101 imposes an important substantive limitation on patentability, or instead is a mostly irrelevant provision that leaves the work of separating patentable from unpatentable inventions to other provisions of the Patent Act. One of the opinions below suggested, for example, that reading Section 101 to contain anything more than a "narrow" exception to patent eligibility is "impermissibly in tension with the statute's plain language and design." Pet.App. 66a–67a (Rader, C.J., concurring-in-part and dissenting-in-part). Under that view, the "substantive" restrictions on patentability are set forth elsewhere in the Patent Act, such as in the novelty and non-obviousness requirements of 35 U.S.C. §§ 102 and 103, leaving Section 101 to serve only a limited role as a "coarse eligibility filter." *Ultramercial*, 722 F.3d at 1341; *see also* Pet.App. 112a (Newman, J., concurring-in-part and dissenting-in-part); *see also, e.g.*, *id.* at 52a (Rader, J., concurring-in-part and dissenting-in-part).

Mayo confirmed, however, that the "threshold" requirements of Section 101 are hardly a coarse filter; instead, they perform an important "screening" function—as the provision's placement at the beginning of the Patent Act suggests. *See Mayo*, 132 S. Ct. at 1303. Indeed, this Court has repeatedly held that Section 101 *is* substantive, and therefore cannot be evaded by the drafter's art. *See* pp. 5, 10–11, *supra*. That is why this Court has long held that a patentee cannot convert unpatentable subject matter into patentable subject matter simply by writing it in the form of a method consisting of a series of steps, adding token or conventional limitations, or limiting the claim to a particular technological context. *See* p. 10, *supra* (citing cases).

Some Federal Circuit judges have nonetheless opined that whether a patent claim contains an "inventive concept" is wholly irrelevant to Section 101 because the novelty and non-obviousness requirements of Sections 102 and 103 (and only those requirements) address inventiveness. Pet.App. 45a–52a (Rader, C.J., concurring-in-part and dissenting-in-part). *Mayo* rejected that formalistic view and expressly "recognize[d]" the "overlap" between Section 101 and the other requirements for patentability. *Mayo*, 132 S. Ct. at 1303–04.

Even apart from *Mayo*, the dissenting judges' objection to considering inventiveness in the Section 101 analysis falters on other controlling precedents of this Court and the statutory text. In *Flook* and *Funk Brothers*, the Court emphasized that the discovery of a mathematical formula or natural phenomenon "cannot support a patent unless there is some other inventive concept in its application," and invalidated patent claims under Section 101 for that very reason. *Flook*, 437 U.S. at 594; *accord Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S.

127, 127–28 (1948). The statutory text itself limits the scope of patentable subject matter to "new and useful" inventions, 35 U.S.C. § 101, explicitly tying patentable subject matter to the presence of something new, *i.e.*, inventive.

Without the "overlap" this Court has recognized between the various requirements for patentability, this Court's precedents limiting patent-eligible subject matter would be "a dead letter." *Mayo*, 132 S. Ct. at 1303. If the addition of conventional, non-inventive limitations were sufficient to establish patent eligibility, patent applicants could easily evade Section 101's limits on patentability in that manner. In *Mayo*, conventional administration of a drug would have sufficed, just as Alice argues that generic computer implementation suffices here. *Cf. id.* at 1303–04.

Moreover, the dispute over whether Congress intended inventiveness to be relevant only to Sections 102 and 103 is not a mere housekeeping matter concerning which section of the Patent Act to cite in the course of considering a patent's validity. Without some consideration of inventiveness in the Section 101 analysis, the fundamental requirement that a claim contain something inventive apart from an abstract idea or natural law would be easily evaded under *all* provisions of the Patent Act by a divide-and-conquer strategy. A patent claim that generically recited implementation of an abstract idea with conventional computer equipment would survive Section 101 scrutiny because the computer equipment is not abstract. But the claim might also survive the novelty and non-obviousness requirements of Sections 102 and 103 on the ground that the (patent-ineligible) abstract idea is novel. *See id.* at 1304 ("one would suppose that a newly discovered law of nature is novel").

As *Mayo* explained, therefore, removing inventiveness from the Section 101 analysis on the theory that Section 102 and 103 address that question would erroneously "assum[e] that [Sections 102 and 103] can do work that they are not equipped to do." *Id.* Under that approach, *Funk Brothers* and *Flook* would have been wrongly decided because there would be *no* requirement, under any of the statutory provisions, that a patent claim contain an inventive aspect other than an abstract idea or natural law. *Mayo* confirmed those cases were not wrongly decided. *Id.* at 1293–94.

2. The Category Of "Abstract Ideas" Is Not Vanishingly Narrow.

In another departure from this Court's precedents, some Federal Circuit judges have held that only "manifestly" abstract ideas are unpatentable. *See, e.g.*, Pet.App. 146a (panel majority opinion); *Ultramercial*, 722 F.3d at 1354. This Court has long held that *all* abstract ideas are ineligible for patenting, not only "manifestly" abstract ideas. Indeed, any heightened burden runs the other way under *Mayo*: a patent claim must include "significantly more" than an abstract idea in order to give "practical assurance" that the claim is *not* ineligible for patenting. *Mayo*, 132 S. Ct. at 1294, 1297.

Alice would further limit the category of abstract ideas to "fundamental truths"; in Alice's view, all other ideas (apparently including non-fundamental truths) are not abstract and thus are eligible for patenting. Pet. Br. 19–29. Although Alice is not clear on exactly how to distinguish fundamental truths from other ideas, Alice appears to equate, or at least it comes very close to equating, a "fundamental truth" with a mathematical formula. *E.g.*, Pet. Br. 22 (referring to "[a] fundamental truth in the sense of a mathematical formula").

That would deprive the "abstract ideas" doctrine of any effect. This Court has long held that there are "*three* specific exceptions" to patent eligibility: "laws of nature, physical phenomena, *and* abstract ideas." *Bilski*, 130 S. Ct. at 3225 (emphasis added) (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)). By equating abstract ideas with mathematical formulas, however, Alice appears to subsume all abstract ideas within natural laws, effectively eliminating the separate "abstract ideas" category. Eviscerating that category is not a reasonable way of defining it.[2]

Alice's position is also irreconcilable with *Bilski*. As Justice Stevens observed, the *Bilski* claims involved far too much detail to be considered a "fundamental truth." 130 S. Ct. at 3235 (Stevens, J., concurring in the judgment); *see also* p. 6, *supra*.

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[2] Alice relies on this Court's statement that "a principle is not patentable. A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *LeRoy v. Tatham*, 55 U.S. (14 How.) 156, 175 (1852). Nothing in that passage purported to provide a comprehensive definition of "abstract," much less to limit the category of "abstract ideas" to fundamental truths.

But the Court unanimously held that all of the claims asserted in that case were impermissibly abstract, as discussed above. *See Bilski*, 130 S. Ct. at 3229–31.

Although it is difficult to formulate a one-size-fits-all definition of "abstract ideas," experience has shown that identifying the abstract idea behind any purported application is generally straightforward. For example, in *Bilski*, the abstract idea was "hedging, or protecting against risk," *id.* at 3231; in *Benson*, the "idea" was "converting [binary-coded decimal] numerals to pure binary numerals." 409 U.S. at 71. The Federal Circuit has likewise identified the abstract concepts underlying numerous patent claims on a case-by-case basis.[3] Generally speaking, computer implementation of activities such as engaging in financial transactions, supplying information, providing goods or services, playing a game, or communicating is an abstract idea if the computer implementation is described only generally, without reciting a specific way of implementing the idea on a computer.

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[3] *See, e.g.*, *Cyberfone Sys., LLC v. CNN Interactive Group, Inc.*, Nos. 2012-1673, -1674, slip op. at 7 (Fed. Cir. Feb. 26, 2013) ("categorical data storage"); *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed. Cir. 2012) ("'the basic concept' of processing information through a clearinghouse"); *Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1322 (Fed. Cir. 2012) ("method of aggregating property, making it subject to an agreement, and then issuing ownership interests to multiple parties"); *Ultramercial*, 722 F.3d at 1349 ("idea that advertising can be used as a form of currency"); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) (method of credit card fraud detection); *In re Comiskey*, 554 F.3d 967, 981 (Fed. Cir. 2009) (method of "mandatory arbitration resolution"); *In re Schrader*, 22 F.3d 290, 291 (Fed. Cir. 1994) (method of bidding at an auction).

II. THE COURT SHOULD REJECT PROCEDURAL BARRIERS THE FEDERAL CIRCUIT RECENTLY ERECTED TO THE CONSIDERATION OF SECTION 101 DEFENSES.

In addition to confirming this Court's precedents on the substantive standard for patent eligibility, this Court should reject the Federal Circuit's recent imposition of two procedural roadblocks to a timely and fair resolution of patent eligibility. Some judges on that court have opined that adjudication of Section 101 issues should generally await formal claim construction and other proceedings, and that a defendant should have to prove patent-ineligibility by clear and convincing evidence. Those novel procedural barriers could render Section 101 largely toothless; indeed, some Federal Circuit judges have championed them (along with the "manifest" standard discussed above) for the express purpose of "cabin[ing]" the abstract-ideas doctrine. Pet.App. 68a (Rader, C.J. concurring-in-part and dissenting-in-part).

A. Patent Eligibility Can And Should Be Resolved At The Outset Of Most Cases.

The Federal Circuit recently instructed district courts that "it will be rare that a patent infringement suit can be dismissed at the pleading stage for lack of patentable subject matter." *Ultramercial*, 722 F.3d at 1338. The court stated that patent eligibility normally depends on findings of fact and interpretation of patent claims' meaning, and that resolving Section 101 defenses on motions to dismiss would "not be a wise use of judicial resources." *Id.* at 1340.

The "threshold" question of patent eligibility is, however, a question of law, not fact, for a court to decide. *See Mayo*, 132 S. Ct. at 1303; Pet.App. 7a; *id.* at 122a (Linn & O'Malley, JJ., dissenting). This Court has never treated any aspect of the patent eligibility analysis as factual or deferred to any findings of fact on that question.

As this case, *Association for Molecular Pathology*, *Mayo*, and this Court's other Section 101 decisions show, a court should be able to determine from the face of a patent whether a claim recites patentable subject matter or instead, for example, generically describes the use of conventional computer equipment to implement an abstract idea. Even in a case with as complicated a background as *Association for Molecular Pathology*, this Court determined that patent claims ineligible under Section 101 without any discovery having been conducted. 133 S. Ct. at 2114–15; *see also id.* at 2120 (Scalia, J., concurring); *Ass'n for Molecular Pathology v. U.S. PTO*, 689 F.3d 1303, 1324 (Fed. Cir. 2012), *rev'd*, 133 S. Ct. 2107.

Nor does adjudication of Section 101 issues normally require claim construction (which itself is a question of law, *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996); *Lighting Ballast Control LLC v. Philips Elecs. N. Am. Corp.*, No. 2012-1014, slip op. at 7, 33 (Fed. Cir. Feb. 21, 2014)). One of the opinions below nonetheless stated that courts should generally await full claim construction before resolving Section 101 issues. Pet.App. 114a, 122a (Linn & O'Malley, JJ., dissenting). A panel subsequently reiterated that view in a binding, precedential decision. *See Ultramercial*, 722 F.3d at 1338.

Experience has shown, however, that formal claim construction is not needed to resolve Section 101 issues in most cases. *See In re Comiskey*, 554 F.3d 967, 973 (Fed. Cir. 2009). In many cases, like this one, the parties agree to use the patentee's proposed constructions for purposes of Section 101, *e.g.*, *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Can. (U.S.)*, 687 F.3d 1266, 1274 (Fed. Cir. 2012), or a court concludes that the result would be the same under either party's construction of the claims, *Compression Tech. Solutions LLC v. EMC Corp.*, No. 12-cv-1746, 2013 WL 2368039, at *3 (N.D. Cal. May 29, 2013); *SmartGene, Inc. v. Advanced Biological Labs., SA*, 852 F. Supp. 2d 42, 65–66 (D.D.C. 2012). A recent Federal Circuit opinion correctly noted that claim construction is not required where the patent holder "does not explain which terms require construction or how the analysis would change." *Cyberfone Sys., LLC v. CNN Interactive Group, Inc.*, Nos. 2012-1673, -1674, slip op. at 7 n.1 (Fed. Cir. Feb. 26, 2013). Likewise, a number of district courts have declined to defer Section 101 motions until after formal claim construction precisely because nothing would be gained from doing so. *E.g.*, *OIP Techs., Inc. v. Amazon.com, Inc.*, No. 12-cv-1233, 2012 WL 3985118, at *5 (N.D. Cal. Sept. 11, 2012); *Digitech Info. Sys., Inc. v. BMW Fin. Servs. NA, LLC*, 864 F. Supp. 2d 1289, 1293 (M.D. Fla. 2012).

Similarly, formal claim construction is not needed if a party's position is unreasonable or can be efficiently resolved without further proceedings. *See* Pet.App. 209a, 223a (district court opinion); *Sinclair-Allison, Inc. v. Fifth Ave. Physician Servs., LLC*, No. 12-cv-360, 2012 WL 6629561, at *3 (W.D. Okla. Dec. 19, 2012). Many courts defer claim construction until after the completion of a long and expensive discovery process, and then address all of the parties' claim-construction disputes—most or all of which are ordinarily relevant only to other issues in the case, not to Section 101. There is no legitimate reason to put the parties to that expense, and a district judge to that burden, when a party's claim construction is not even reasonable or could be resolved in a straightforward manner without full-blown proceedings on all of the other claim-construction disputes in a case.

The increasing number of district court decisions granting Section 101 motions without engaging in formal claim construction in recent years is telling.[4]

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[4] *E.g.*, *Lumen View Tech. LLC v. Findthebest.com, Inc.*, __ F. Supp. 2d __, 2013 WL 6164341, at *15 & n.7 (S.D.N.Y. Nov. 22, 2013); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, Nos. 12-2501, -6960, 2013 WL 3964909, at *5 (D.N.J. July 31, 2013); *Compression Tech. Solutions*, 2013 WL 2368039, at *3; *Cardpool, Inc. v. Plastic Jungle, Inc.*, No. 12-4182, 2013 WL 245026, at *4 (N.D. Cal. Jan. 22, 2013); *Sinclair-Allison*, 2012 WL 6629561, at *3; *Graff/Ross Holdings LLP v. Fed. Home Loan Mortg. Corp.*, 892 F. Supp. 2d 190 (D.D.C. 2012); *OIP Techs.*, 2012 WL 3985118, at *5; *CyberFone Sys. LLC v. Cellco P'Ship*, 885 F. Supp. 2d 710, 715, 719 n.8 (D. Del. 2012), *aff'd*, Nos. 2012-1673, -1674; *Digitech Info. Sys.*, 864 F. Supp. 2d at 1292–93; *SmartGene*, 852 F. Supp. 2d at 65–66; *CyberSource Corp. v. Retail Decisions, Inc.*, 620 F. Supp. 2d 1068, 1073 (N.D. Cal. 2009), *aff'd*, 654 F.3d 1366.

As these cases demonstrate, the correct approach is *not* to engage in formal claim construction before resolving Section 101 motions unless the non-movant (usually the patentee, but perhaps a defendant responding to a patentee's motion for summary judgment) articulates a reasonable reading of the claims that requires further proceedings to resolve and would change the result. Indeed, deferring Section 101 issues until a court has resolved all claim construction disputes in a case is difficult to square with the Federal Circuit's admonition that courts should *avoid* unnecessary claim construction rulings because such a ruling might amount to an "impermissible advisory opinion." *Superior Indus. v. Masaba*, No. 13-1302, 2014 WL 163046, at *4 (Fed. Cir. Jan. 16, 2014).

At a minimum, district courts should not be *discouraged* from resolving Section 101 defenses expeditiously. District courts have considerable discretion to manage the cases before them in an efficient manner. *See, e.g.*, Fed. R. Civ. P. 16. Deferring Section 101 rulings would sanction litigation abuse by unnecessarily subjecting defendants to lengthy, expensive discovery related to infringement, invalidity, enforceability, damages, entitlement to equitable relief, and other issues in a case. It could also prolong litigation of Section 101 issues through not only claim construction, but also the summary judgment stage and potentially a trial. *Cf. Ass'n for Molecular Pathology v. U.S. PTO*, 653 F.3d 1329, 1379–80 (Fed. Cir. 2011) (Bryson, J., concurring in part and dissenting in part), *vacated*, 132 S.Ct. 1794 (2012).

That is important because, as discussed below, much of the harm from low-quality computer-related patents takes the form of litigation expenses and settlements. *See* pp. 32–34, *infra*. Many companies already pay substantial sums to settle meritless cases because their litigation expenses would exceed the plaintiff's settlement demand. *See, e.g.*, Brian J. Love, *Why Patentable Subject Matter Matters for Software*, 81 Geo. Wash. L. Rev. Arguendo 1, 9–10 (2012), http://www.gwlr.org/wp-content/uploads/2012/09/Love_Arguendo_81_1.pdf. Discovery costs alone have become a powerful incentive for some patent plaintiffs to file strike suits for quick settlements. *See Eon-Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1327 (Fed. Cir. 2011). Delay in resolving Section 101 defenses would increase the nuisance value of settlement, deter product development, and unnecessarily burden the district courts.

B. There Is No Valid Reason To Apply A Heightened Burden Of Proof On This Legal Question.

Alice contends that CLS Bank should have to prove patent ineligibility by "clear and convincing evidence." Pet. Br. 43. Some of the Federal Circuit judges below agreed. Pet.App. 68a (Rader, C.J., concurring-in-part and dissenting-in-part). That impediment to Section 101 defenses is as unwarranted as the "manifestly" abstract standard discussed above. This Court has never imposed a clear-and-convincing-*evidence* burden on Section 101 defenses for the simple reason that this is a question of *law*, not fact. *See* p. 19, *supra*.

The clear-and-convincing-evidence standard is a "standard of proof [that] applies to questions of fact and not to questions of law." *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2253 (2011) (Breyer, J., concurring). Standards of proof "instruct the *factfinder* concerning the degree of confidence our society thinks he should have in the correctness of *factual* conclusions for a particular type of adjudication." *Addington v. Texas*, 441 U.S. 418, 423 (1979) (emphases added) (quoting *In re Winship*, 397 U.S. 358, 370 (1970) (Harlan, J., concurring)). As its name suggests, therefore, "a standard of proof [does not apply] to a purely legal question." *Branson Sch. Dist. RE-82 v. Romer*, 161 F.3d 619, 636 n.15 (10th Cir. 1998). The Federal Circuit itself has found it "inappropriate to speak in terms of a particular standard of proof being necessary to reach a legal conclusion." *SSIH Equip. S.A. v. U.S. ITC*, 718 F.2d 365, 375 (Fed. Cir. 1983); *see also Newell Cos., Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 767 (Fed. Cir. 1988).

Allowing evidentiary standards to infect the analysis of legal questions would skew outcomes in ways detrimental to innovation. Invalid patents "stifle, rather than promote, the progress of useful arts" by blocking or taxing innovation. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 427 (2007); *accord Lear, Inc. v. Adkins*, 395 U.S. 653, 656 (1969). Thus, the public "has a 'paramount interest in seeing that patent monopolies are kept within their legitimate scope,'" as further explained below. *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, 134 S. Ct. 843, 851 (2014) (quoting *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 816 (1945)); *see also* pp. 29–32, *infra*. Thus, "[b]y preventing the 'clear and convincing' standard from roaming outside its fact-related reservation, courts can increase the likelihood that [alleged] discoveries or inventions will not receive legal protection where none is due." *i4i*, 131 S. Ct. at 2253 (Breyer, J., concurring). There is no valid reason to force accused infringers to fight an uphill battle on legal issues under a clear-and-convincing-evidence standard.

III. A PLAGUE OF ABSTRACT COMPUTER-RELATED PATENTS IS IMPAIRING AND TAXING INNOVATION IN THE HIGH-TECH SECTOR.

Fair and timely enforcement of the limits on patentable subject matter is especially important for computer-related inventions, and those inventions in turn are especially important to our computer-age economy.

1. As *amici* and other innovators recognize, it is easy to think of abstract ideas about what a computing system, device, or Internet website might do. The difficult, valuable, and often ground-breaking part comes next: designing, analyzing, building, and deploying the interface, software, and hardware to implement that idea in a way that is useful in daily life. And for any given idea (such as financial intermediation), different innovators could develop different applications by, for example, using different programming techniques or algorithms to implement the idea in different, perhaps more efficient, ways. Ronald J. Mann, *Do Patents Facilitate Financing in the Software Industry?*, 83 Tex. L. Rev. 961, 978 n.95 (2005); *accord* Peter T. Luce, *Hiding Behind Borders in a Borderless World: Extraterritoriality Doctrine and the Inadequacy of*

U.S. Software Patent Protections in a Networked Economy, 10 Tul. J. Tech. & Intell. Prop. 259, 277–78 (2007).

The asserted patent claims, however, would foreclose that very innovation by broadly claiming an idea when done on a computer or over the Internet. Unfortunately, these claims are typical. Many software patents simply claim a result (such as financial intermediation) by reference to a computer or the Internet. Kevin E. Collins, *Patent Law's Functionality Malfunction and the Problem of Overbroad, Functional Software Patents*, 90 Wash. L. Rev. 1399, 1440–43 (2013). Because "all computers have standard elements" and can run software programs, claims like Alice's that only generically recite computer implementation of an idea "take abstraction in patent claiming to an extreme." Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wisc. L. Rev. 905, 919. Because such claims do not disclose or limit themselves to a particular way of implementing the idea, they "claim everything and contribute nothing." Mark A. Lemley *et al.*, *Life After* Bilski, 63 Stan. L. Rev. 1315, 1338 (2011).

Such claims are inimical to the fundamental bargain underlying the patent system. Those who disclose their inventions are entitled to exclusive rights commensurate with, but no broader than, their disclosures. *J.E.M.*, 534 U.S. at 142. "By requiring that patent claims be limited to a specific set of practical applications of an idea, the abstract ideas doctrine . . . leaves room for subsequent inventors to improve upon—and patent new applications of—the same basic principle." Lemley, 63 Stan. L. Rev. at 1317. The patent system thereby encourages inventors "to 'design around' a competitor's products" by developing new and potentially better ways of achieving the same result (such as financial intermediation on a computer). *TiVo Inc. v. EchoStar Corp.*, 646 F.3d 869, 883 (Fed. Cir. 2011) (quoting *State Indus., Inc. v. A.O. Smith Corp.*, 751 F.2d 1226, 1236 (Fed. Cir. 1985)).

In short, Section 101 in particular, and the Patent Act in general, stimulate innovation by "not granting monopolies over procedures that others would discover by independent, creative application of general principles." *Bilski*, 130 S. Ct. at 3228. Claims like these that merely recite a familiar idea when done on a computing system or over the Internet, without more, are ineligible for patenting because they would add little if anything to human knowledge while broadly foreclosing future development by others.[5]

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[5] In this respect, Section 101's prohibition on abstract claims overlaps with the longstanding prohibition on purely functional claims. As the plurality repeatedly noted, the asserted claims are "functional" because they recite, for example, a computer "configured to" perform financial intermediation, but do not disclose or limit themselves to a specific way of configuring a computer to perform that task. *E.g.*, Pet.App. 29a–30a, 34a. Claims that cover "the result or function of a machine," instead of a specific way to accomplish that result, are invalid because they would "extend the monopoly beyond the invention," *i.e.*, beyond the specific way (if any) the patent applicant invented for achieving the result. *Holland Furniture Co. v. Perkins Glue Co.*, 277 U.S. 245, 257, 258 (1928); *accord Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1, 9 (1946); *General Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 371 (1938).

2. Although some have suggested that invalidating such patents would "swallow . . . much of the investment and innovation in software," Pet.App. 76a (Rader, C.J., concurring-in-part and dissenting-in-part), history proves otherwise. The computer industry grew rapidly without reliance on abstract software patents. Such patents became commonplace only after the Federal Circuit changed the rules to sanction them in a series of decisions that began in the late 1980s and culminated in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) (en banc). That new jurisprudence led to an explosion in such patents—and litigation over them. *See* James Bessen, *A Generation of Software Patents* at 12, 22 (Aug. 2011), http://works.bepress.com/cgi/viewcontent.cgi?artiele=1000&context=james_bessen ("*Software Patents*").

Until then, however, software industry leaders had not even believed that such patents were valid, let alone relied on them. As early as 1991, Microsoft founder and CEO Bill Gates noted that, "[i]f people had understood how patents would be granted when most of today's ideas were invented, and had taken out patents, the industry would be at a complete standstill today." Memorandum from Bill Gates, *Challenges and Strategy* at 5 (May 16, 1991), *available at* http://antitrust.slated.org/www.iowaconsumercase.org/011607/0000/PX00738.pdf. In public hearings, Adobe and Oracle likewise confirmed that they had built their successful businesses "believ[ing] that there was no possibility of patenting our work." Testimony of Douglas Brotz, Adobe Systems, Inc., PTO Hearing (Jan. 26, 1994), *available at* http://www.uspto.gov/web/offices/com/

hearings/software/sanjose/sj_brotz.html; Testimony of Jerry Baker, Oracle Corp., PTO Hearing (Jan. 26, 1994), *available at* http://www.uspto.gov/web/offices/com/hearings/software/sanjose/sj_baker.html. That did not stop Adobe "from creating that software, nor did it deter the savvy venture capitalists who helped us with the early investment." Brotz Testimony, *supra*.

As those examples illustrate, success in computer-related industries has never depended on overbroad, abstract patents. It has depended on developing innovative products and services—*i.e.*, specific *applications* of abstract ideas. That is the very innovation that such patents would block.

3. The exponential growth of software patents poses a serious threat to computer-related industries. In 1980, roughly 2,000 software patents were issued per year. *Software Patents*, *supra*, at 28 fig. 1. By 1996, two years after *Alappat*, the Patent and Trademark Office was issuing over 10,000 software patents a year as applicants sought to take advantage of the new Federal Circuit jurisprudence. *Id.* By 2009, that number had quadrupled to 40,000 new software patents annually. *Id.* By last year, approximately 400,000 total software patents were in effect, a number that continues to grow. *See* Brian J. Love, *No: Software Patents Don't Spur Innovation, but Impede It*, Wall Street J. (May 13, 2013) *available at* http://ssrn.com/abstract=2278972 ("Love, *Software Patents*").

The owners of software patents have not been shy about asserting them. Such patents are litigated eight times as often as other patents, and have accounted for about 46 percent of all patent lawsuits and 64 percent of the defendants in those suits between 2007 and 2011. John R. Allison *et al.*, *Patent Litigation and the Internet*, 2012 Stan. Tech. L. Rev. 3 ¶ 39, http://stlr.stanford.edu/pdf/allison-patent-litigation.pdf; Gov't Accountability Office, *Intellectual Property: Assessing Factors that Affect Patent Infringement Litigation Could Help Improve Patent Quality* at 21 (Aug. 2013), http://www.gao.gov/assets/660/657103.pdf.

Thus, abstract software patents are not a minor annoyance; they are very real and growing plague. Weak policing of Section 101 is a significant cause of this problem: "Why are software patents more frequently litigated? In a word, abstraction." James Bessen & Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk*, at 22 (2008) ("Patent Failure").

The sheer volume of such innovation-blocking patents creates a "patent thicket" that "generate[s] larger administrative costs as acquiring the patent rights needed to undertake a research agenda or manufacture a product becomes, at best, more costly and, at worst, not feasible." Collins, 90 Wash. L. Rev. at 1411–12. As a White House report recently explained, moreover, innovators often "find themselves inadvertently infringing patents, both because of the sheer number of patents and because commercial need is driving many inventors to create similar inventions near-simultaneously." The White House, *Patent Assertion and U.S. Innovation*, at 7 (June 2013), http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf ("White House Report").

Avoiding infringement of these broad patents by designing around them during product development, or negotiating a reasonable license before design decisions are finalized, is often infeasible due to a "notice failure": because abstract software claims are "notoriously difficult to interpret," and there are so many of them, "innovative firms are targeted in patent infringement suits through no fault of their own." James Besson & Michael Meurer, *The Direct Costs from NPE Disputes*, at 8 (forthcoming Cornell L. Rev. 2014), http://ssrn.com/abstract=2091210 ("*Direct Costs*"). "Especially for business methods and software, the patent system provides innovators who might be targeted with a patent suit with little information about the existence, ownership, or scope of relevant patent rights." *Id.* at 35.

Moreover, the fast pace of innovation leads to "the danger that new products will inadvertently infringe on patents issued *after* these products were designed." *See* Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 Innovation Pol'y & Econ. 119, 119 (2000) (emphasis added). The industry is outpacing the patent system, meaning technology is developing at a faster pace than patents are granted. As patent applications pile up, innovators risk infringing any number of them just to keep up with the pace of technological development. Love, *Software Patents*, *supra*.

This danger is only heightened by the increasing prevalence of computer equipment and software in our increasingly technological society. Many devices used in daily life, from cellular phones to automobiles, include computer hardware and software. Allowing patents for abstract ideas simply because the ideas would be implemented through such equipment would stifle innovation in a broad (and growing) swath of the modern economy.

Software patents are similar to business-method patents in these respects; indeed, Alice's patent is a business-method patent. This Court has recognized that such patents "raise special problems in terms of vagueness and suspect validity," and that without a "high enough bar," "patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change." *Bilski*, 130 S. Ct. at 3229. Indeed, the number of companies facing such claims has grown on average 28% per year since 2004, with especially high growth beginning in 2010. *See* Patent Freedom, *The Growing Use of Business Method Patents in NPE Litigation* (Sept. 4, 2013), http://www.patentfreedom.com/about-npes/blog/the-growing-use-of-business-method-patents-in-npe-litigation; Patent Freedom, *Investigations into NPE Litigation Involving Business Method Patents* (Sept. 4, 2013), https://www.patentfreedom.com/wp-content/uploads/2013/09/NPE-Ligitations-involving-Business-Method-Patents_Sept-4-2013.pdf.

4. The high costs of patent litigation compound the problem. When faced with claims on low-quality software patents, innovators face a choice of gambling on litigation or paying license fees for technology they already paid once to develop independently. Either path imposes significant costs that effectively tax innovation. Patent suits are extraordinarily expensive to litigate and subject to material uncertainty. Dep't of Commerce, *Patent*

Reform: Unleashing Innovation, Promoting Economic Growth & Producing High-Paying Jobs, at 5–6 (Apr. 13, 2010), http://www.commerce.gov/sites/default/files/documents/migrated/Patent_Reform-paper.pdf ("DOC Report"). But if a company decides to negotiate a license to avoid the risk and cost of litigation, the patentee can use the innovator's already-incurred development costs, and the additional costs that would be required to change to a different technology, "as negotiating leverage for a higher royalty than the patented technology could have commanded ex ante." Fed. Trade Comm'n, *The Evolving IP Marketplace*, at 8 (Mar. 2011), http://www.ftc.gov/os/2011/03/110307patentreport.pdf ("FTC Report").

The real-world consequences of this system are serious. One study found that patents in these industries have produced net litigation costs far in excess of the net profits derived from the patents themselves. Patent Failure, *supra*, at 15–16, 144; *see also* DOC Report, *supra*, at 5.

The Federal Circuit's willingness to credit such patent claims plays into the hands of patent-assertion entities ("PAEs"). As the Federal Trade Commission found, PAEs obtain "overbroad, vague claims" they might assert against a broad range of activity, wait for others to do the hard work of developing applications—and then sue the real innovators. *See* FTC Report, *supra*, at 8–9, 50–51, 60–61. One study found that PAE suits were associated with "*half a trillion dollars* of lost wealth to defendants from 1990 through 2010" (or roughly $25 billion per year). James Bessen *et al.*, *Private and Social Costs of Patent Trolls*, 34 Regulation 26, 26 (2011), http://www.cato.org/pubs/regulation/regv34n4/v34n4-1.pdf (emphasis added). That trend has only continued since then; the most recent study estimated that the direct costs of PAE suits in 2011 totaled $29 billion. *Direct Costs, supra*, at 3.

Lawsuits brought by PAEs have quadrupled since 2005 and now account for a majority of patent litigation. *See* RPX Corp., *NPEs Have Broader Impact Than GAO Headlines* Suggest (Sept. 9, 2013), http://www.rpxcorp.com/rpx-blog?month=9%2F1%2F2013; RPX Corp., *Tracking PAE Activity* (Jan. 23, 2013), http://www.rpxcorp.com/rpx-blog?month=1%2F1%2F2013. The vast majority of these cases—about 82%—involve software and internet patents. *See* Colleen Chien & Aashish Karkhanis, *Software Patents & Functional Claiming* 6 (Feb. 12, 2013), http://www.uspto.gov/patents/init_events/software_ak_cc_sw.pdf.

One study estimated, based on litigated patents, that 100% of PAE software patents and 50% of non-PAE software patents use abstract, functional claiming. *Id.* at 40. As the White House recently explained, therefore, "broad, functionally-defined . . . patents are . . . a key part of the PAE business model." White House Report, *supra*, at 8.

An important step toward fighting patent abuse is "rigorous implementation" of this Court's decisions "restricting the patentability of business methods and other abstract processes." *Direct Costs, supra*, at 40. The Court should instruct the Federal Circuit that, because this Court's Section 101 precedents mean what they say, computer-related patents do not deserve a free pass from Section 101's important screening function.

CONCLUSION

For the foregoing reasons, the judgment of the court of appeals should be affirmed.

Respectfully submitted.

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Supreme Court of the United States

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Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

◆

ON WRIT OF CERTIORARI TO
THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

◆

BRIEF OF AMICI CURIAE PROFESSOR LEE HOLLAAR AND PETER K. TRZYNA IN SUPPORT OF NEITHER PARTY

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Statement of Interest of *Amici Curiae*[1]

Lee A. Hollaar is a professor of computer science in the School of Computing at the University of Utah, where he teaches courses in computer and intellectual property law and computer systems and networking. He has been programming computers since 1964 and designing computer hardware since 1969. He received his B.S. degree in electrical engineering from the Illinois Institute of Technology in 1969 and his Ph.D. in computer science from the University of Illinois at Urbana-Champaign in 1975. Prof. Hollaar was a Fellow with the Senate Committee on the Judiciary and technical advisor to its chair, Senator Hatch, and a visiting scholar with Judge Randall R. Rader at the Court of Appeals for the Federal Circuit.

As an inventor and patentee of computer-implemented technology, a Registered Patent Agent involved with the prosecution of patent applications since 1989, an expert witness and special master in patent litigation, the author of *Legal Protection of Digital Information* (BNA Books, 2002) and course material on computer-implemented patents, and teacher of that material, he is concerned that the decision in this case might continue the unclear lines of what is statutory subject matter by making distinctions that are not tied to real technological differences or may force inventors of computer-based inventions to claim them in ways that obscure the patentable advance over the prior art. Having taught patent law to computer science and engineering students for almost two decades, he has seen how the disconnect between the current computer statutory subject matter distinctions and the realities of technology make it difficult to understand the current tests, to the detriment of innovators (especially those involved in software startups) and the patent system.

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[1] In accordance with Supreme Court Rule 37.6, counsel listed on the cover states that this brief was authored by amici curiae Professor Hollaar and reviewed by Peter K. Trzyna as counsel, and that counsel to a party did not author this brief in whole or in part. No person other than the amici curiae and their counsel made a monetary contribution to the preparation or submission of this brief.

Petitioners and Respondent have consented to the filing of this brief and their consents have been filed with the Court.

Peter K. Trzyna has been a Registered Patent Attorney since 1984 and is a member of the Illinois, New York, D.C., Federal Circuit, and Supreme Court bars. He has been doing patent prosecution for over 25 years, including as an attorney at Kenyon & Kenyon; Cadwalader, Wickersham & Taft; and Baker & McKenzie, where he was a partner in the Chicago office, prior to establishing the Peter K. Trzyna Law Office, P.C.. Mr. Trzyna has a B.S., M.A., J.D. and M.S. in Engineering and Applied Physical Science, all from the University of Wisconsin. A joint inventor in fourteen patents and numerous pending patent applications, most of which are computer science related, Mr. Trzyna also is the owner of several small businesses, including Windy City Technology, a plaintiff in a successful patent infringement litigation. He has been extensively quoted about patent law in the *Wall Street Journal*, *New York Times*, *Economist*, *Washington Post*, and has co-authored articles[2] directed to whether patent law makes technological sense. Having obtained hundreds of patents and having many litigated, he has seen technologically unsound USPTO rejections and courts mired in trying to make sense of the intersection of computer science and patent law.

The views expressed here are solely those of Professor Lee Hollaar and Peter K. Trzyna, who respectfully submit that this Court's decision should draw a clear Sec. 101 line that is understandable and simple to apply because that line is firmly supported by technology and is in complete accord with this Court's past opinions.

Summary of the Argument

Last term, this Court unanimously demonstrated that by resisting the temptation to look at a broad characterization of a patent, and instead looking at what was actually being claimed, it was possible to state a clear and sensible rule regarding statutory subject matter.[3] In this appeal, this Court should again state a clear and sensible rule.

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[2] James R. Goodman, Todd E. Marlette, and Peter K. Trzyna, "Toward a Fact-based Standard for Determining Whether Programmed Computers are Patentable Subject Matter: The Scientific Wisdom of *Alappat* and the Ignorance of *Trovato I*," *Journal of the Patent and Trademark Office Society*, May 1995, Vol. 77, No. 5, 353-367; James R. Goodman, Todd E. Marlette, and Peter K. Trzyna, "The *Alappat* Standard for Determining That Programmed Computers are Patentable Subject Matter," *Journal of the Patent and Trademark Office Society*, October 1994, Vol. 76, No. 10. 727-802.

For the more than four decades since this Court finally found an acceptable method claim for a computer-based invention, lower courts have been struggling to determine where to draw the patentable subject matter line. Though many consider this Court's *Benson*[4]*-Flook*[5]*-Diehr*[6] trilogy of decisions, recently confirmed by this Court in *Bilski*,[7] confusing and contradictory, a careful reading of the full record in each case shows that they all follow a simple, bright-line test for statutory subject matter: methods claimed as limited to particular embodiments are statutory, but unembodied claims are nonstatutory "abstract ideas."

By having this clear and simple test of statutory subject matter for computer-implemented inventions, the remaining patentability requirements (novelty, non-obviousness, and commensurate disclosure) can then play their roles in solving today's problems with patents on computer-implemented inventions, something that cannot be done simply by trying to use the statutory subject matter test for this purpose.

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[3] *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. ___ (2013). Rather than simply view the patents as on "human DNA," this Court looked to the language of the claims, holding that isolated DNA claims were for a "product of nature" and were unpatentable, but those for cDNA were patentable as man-made creations.

[4] *Gottschalk v. Benson*, 409 U.S. 63 (1972).

[5] *Parker v. Flook*, 437 U.S. 584 (1978).

[6] *Diamond v. Diehr*, 450 U.S. 175 (1981).

[7] *Bilski v. Kappos*, 561 U.S. ___ (2010).

Introduction

Since this Court first considered the patentability of computer-implemented inventions more than four decades ago, the use of computer technology has expanded well beyond the use of an expensive digital computer to control an industrial process to being seemingly omnipresent today. Microwave ovens, washers and dryers, televisions and radios, thermostats, furnaces and boilers, sprinkler controllers, clocks, and telephones are but a few of the appliances where an embedded computer has replaced mechanical timers, gears, and switches, resulting in more reliable products with more functionality at lower prices.

To exclude inventions from possible patent protection merely because they are computer-implemented would ignore today's information revolution and relegate the United States patent system to the 19th century. And trying to do so at this time may be impossible. As a recent GAO report noted, "By 2011 patents related to software made up more than half of all issued patents."[8]

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[8] United States Government Accountability Office, "Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality," GAO-13-465, August 2013, at 13. http://www.gao.gov/assets/660/657103.pdf.

Although the particular implementation or expression in computer software can be protected by copyright, that is not sufficient since copyright protection does not "extend to any idea, procedure, process, system, [or] method of operation,"[9] the very innovation that patents are intended to protect. Instead, today copyright protection is essentially limited to literal copying or taking advantage of source code from a former employer. But before patents on computer-implemented inventions became common, courts were expanding the nonliteral scope of copyright to "structure, sequence, and organization" of computer programs,[10] giving patent-like protection without the benefit to the public of disclosure and claiming. And in many cases, a new software technique is self-revealing, so that trade secret protection is not available.

Given the huge economic impact of computer-based technology, and the need to protect the investments that drive that innovation, any reduction in the availability of patent protection for computer-implemented techniques would likely result in new distortions to copyright and trade secret law as they are pushed again to fill the gap that would follow from the loss of possible patent protection.

Even if one is concerned about "software patents," trying to address them by drawing a non-inclusive and confusing statutory subject matter line will only result in patent claims that obscure the invention, and therefore make it harder to examine, enforce, or invalidate. It is far better to have a simple, clear test and then enforce the remaining requirements for getting a patent to weed out potentially-problematic patents.

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[9] 17 U.S.C. § 102(b).

[10] See, for example, *Whelan Associates Inc. v. Jaslow Dental Laboratory, Inc., et al*, 797 F.2d 1222 (3d Cir. 1986).

The computer-based inventions of today clearly possess the "inventive concept" that this Court has noted.

In *Mayo v. Prometheus,*[11] this Court noted that past decisions insisted that "a process that focuses upon the use of a natural law also contain other elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself." Today's software, and in particular the invention at issue here, easily meet that requirement.

Computer programs are no longer just the evaluation of some well-known formula that expresses a natural law, possibly followed by a little post-solution activity, as was the case thirty-five years ago when this Court decided *Flook* and held that "The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."[12]

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[11] *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. ___ (2012).

[12] 437 U.S. at 590.

Instead, most computer-based inventions are complex systems, often involving activities distributed across multiple computers communicating over networks, that process data through a series of tests and transformations and not simply solving a known formula. They use specialized input devices, such as the now-common "mouse," touch-screens, or even voice recognition, along with high-quality displays not possible at the time of *Flook*, to permit human-computer interactions that go well beyond mere post-solution activity.

Looking at the method claims in Alice's patents, and comparing them to the claims in *Flook*, it is essentially impossible to see what "formula" Alice's invention is solving or "law of nature" it is using. Instead, the claims require a series of steps that retrieve and manipulate data in what the patent office determined was a novel and nonobvious way, to achieve a clearly useful result.

A computer-implemented invention that simply computes the result of a known formula and uses that result in a conventional matter is not patentable because it is obvious in today's world, not because it is not statutory subject matter.

Patents on computer-implemented inventions are *not* patents on mathematics.

One argument the opponents of patents for computer-implemented inventions make is that software is mathematics, and mathematics is not patentable.[13]

But in most instances, the correspondence between computer programs and mathematics is merely cosmetic. For example, Einstein's famous equation $E=mc^2$ expresses a relationship between energy and matter, while the computer program statement E=M*C**2 represents the calculation of M times C (M and C designating what is stored in particular memory locations, which may or may not be related to mass and the speed of light) raised to the second power and then assigning the result to a storage location named E. The program statement E=M*C**3 is equally valid in a computer program, but would be simply wrong as a natural law.

Unfortunately for understanding this distinction, early developers of programming languages made their calculation-and-assignment statements look like mathematical equations to seem familiar to scientists and engineers. However, a computer program is a series of statements that perform the specified operations and assign the result to a designated memory location, not a set of mathematical equations that are solved for their results.

Even if we assume that a computer program includes a series of mathematical equations, that assumption ignores how computer-implemented inventions are usually claimed. Claims that include data structures in random-access memories, input devices such as keyboards or mice, screen display devices, clocks and time-outs, and computer networks (common in computer-implemented patents) are no longer equivalent to pure mathematics.

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[13] *Benson*, 409 U.S. 63 (1972), is generally cited for that proposition.

Again, it is difficult to see "mathematics" in the series of tests and data manipulations that Alice has recited in its method claims.

Section 101 plays an important, but limited, role in determining patentability.

The question before this Court is whether CLS has established that the claims in the Alice patents fail to recite statutory subject matter,[14] not whether they are valid patents over prior technology. As this Court noted in *Diehr*:

> The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.[15]
>
> * * *
>
> The question, therefore, of whether a particular invention is novel is "wholly apart from whether the invention falls

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[14] Unlike *Flook*, *Bilski*, and other decisions, Alice holds patents that are presumed to be valid, and the burden should be on the challenger to establish that they are not statutory subject matter.

[15] *Diamond v. Diehr*, 450 U.S. at 188-189.

> into a category of statutory subject matter."[16]

Trying to use a broad statutory subject matter test for more than its narrow intended purpose can result in inordinate time being spent during the examination of a patent application on statutory subject matter considerations, to the detriment of the time available for the more important considerations of novelty, non-obviousness, and whether the patent application disclosure fully supports the claim.

This Court has made it clear that

> In cases of statutory construction, we begin with the language of the statute. Unless otherwise defined, "words will be interpreted as taking their ordinary, contemporary common meaning," and, in dealing with the patent laws, we have more than once cautioned that 'courts should not read into the patent laws limitations and conditions which the legislature has not expressed.'"[17]

Congress used broad language to indicate what should be patentable. Three of the categories – machine, manufacture, or composition of matter[18] –

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[16] *Id.*, at 190, citing *In re Bergy*, 596 F.2d 952, 961 (CCPA 1979).

[17] *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980), quoting *Perrin v. United States*, 444 U.S. 37, 42 (1979), and *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933).

[18] 17 U.S.C. § 101.

"include anything under the sun that is made by man."[19] Being cautious in limiting Congress' intent, this Court has excluded from the sweep of Section 101's broad language only "laws of nature, physical phenomena, and abstract ideas."[20]

As illustrated by examination of the patent resulting from this Court's *Diehr* decision, over-reliance on statutory subject matter as a filter can result in questionable patents.

The prosecution history of United States Patent 4,344,142,[21] the patent that issued as a result of the Supreme Court's decision in *Diehr*, is instructive. Following this Court's decision on March 3, 1981, the patent application was returned to the examiner. On September 28, 1981, Diehr slightly amended the claims so that they better matched the way that the courts had interpreted them, and on March 23, 1982, the examiner allowed the amended application.

Rather than a typical office action, in which the examiner cites prior art and indicates that the claimed invention would be obvious in light of that prior art, Diehr's office action after this Court's decision reads more like a response from an applicant. Two patents are cited as prior art, and the examiner then points out how each patent differs from the claimed invention. The examiner does not discuss why those differences would not be obvious, particularly in light of other prior art that may teach those differences.[22]

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[19] S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952), cited by this Court in *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980).

[20] *Chakrabarty*, *supra*, at 308

[21] Available at http://www.digital-law-online.info/papers/lah/diehr/.

The prosecution histories of many early computer-implemented patents[23] show that when the examiner initially rejected the claims based on statutory subject matter grounds, much of the subsequent prosecution of the application was spent finding claim language that would overcome the statutory subject matter rejection. When such language was found (usually not substantially different in scope from the original claim language), the application generally was allowed with only the slightest consideration of prior art.[24]

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[22] One difference was that Diehr explicitly claimed determining the temperature "at a location closely adjacent to the mold cavity" and the other difference was that Diehr performed a continuous comparison, neither of which seems enough to render the claims unobvious over the prior art.

[23] On June 2, 1995, the United States Patent and Trademark Office proposed examination guidelines for determining when a computer-implemented invention is statutory subject matter, with final guidelines effective on February 28, 1996. In light of the guidelines, rejections based on lack of statutory subject matter substantially declined, both because applicants had a clear idea of how to claim their computer-implemented inventions to meet the statutory subject requirement and because examiners had a clearly-stated test for determining statutory subject matter.

However, because of the confusion caused by the Federal Circuit's split decision in this case, we are seeing a resurgence of statutory subject matter rejections, sometimes to the exclusion of more meaningful examination.

[24] History is now repeating itself. Since the Federal Circuit held that "signals" were not "articles of manufacture" in *In re Nuitjen*, 515 F.3d 1361 (Fed. Cir. 2008), there have been many

Rigorous application of the other conditions for patentability addresses this Court's past concerns regarding computer-based inventions.

As was shown with the examination of the Diehr patent, reliance on an unclear test for statutory subject matter substantially detracts from performing the other critically-important patent examination tasks. The way to address the concerns about patents on computer-based inventions is to rigorously apply all patent requirements, including novelty, non-obviousness, clear claiming, and sufficient disclosure.

For example, the Federal Circuit's developing law on full-scope enablement,[25] discourages the use of overly-broad claim language, lest their patent claims be found invalid for lack of enablement. This goes to the heart of the "patent bargain" – an inventor getting a patent in trade for disclosing how to make and use the claimed invention. In *O'Reilly v.*

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rejections and appeals as suitable language is found. Currently, the USPTO accepts claims to "non-transitory tangible media," even if there is no discussion of that term in the specification.

[25] See, for example, *Sitrick v. Dreamworks*, 85 U.S.P.Q.2d 1826 (Fed. Cir. 2008).

Morse,[26] claim 8, the use of "electro-magnetism, however developed for marking or printing intelligible characters, signs, or letters, at any distance" went well beyond what was disclosed in the application, and was properly rejected for that reason.

Claiming a computer-based invention as a method makes it easier to determine whether the claim is commensurate with the disclosure. And unlike claiming the invention using functional elements, claiming as method steps should help avoiding having to guess at what structure in the specification defines each claim element, how broadly that structure should be read, and what are its equivalents.

Similarly, simply drafting the claim as an apparatus or machine or system performing a well-known function does not make it patentable. Today, it is well-known how to program a computer to implement a specified method. Even if computer programming was somewhat of a mystery at the time of *Benson*, today junior high school students (or even younger) are writing computer programs. Giving the examiner a simple test for the initial determination of statutory subject matter will give more time for the important determination of whether an invention is obvious or not, particularly in light of well-known methods.

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[26] 56 U.S. (15 How.) 62 (1853).

When is a process an unpatentable "abstract" idea?

This Court has repeatedly held that laws of nature, physical phenomena, and abstract idea are judicially-made exceptions[27] to the broad statutory subject matter categories. While the first two categories are generally understood, there is much confusion about when an idea is "abstract," especially regarding computer-implemented inventions.

The dictionary definition of "abstract," an unembodied method, is consistent with all of this Court's statutory subject matter decisions for computer-based inventions.

From looking at many writings on the subject of statutory subject matter, one would think that when this Court in *Benson* said that abstract ideas were not patentable, it was coining a wholly-new term and then neglecting to define it. Nothing could be further from the facts. As demonstrated by the leading dictionaries at the time, "abstract" in the context used by this Court had a clear and simple definition.

The first non-archaic definition for "abstract" in *Webster's Third* is:

> 2a.: considered apart from any application to a particular object or

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[27] Laws of nature and physical phenomena may not be true exceptions because Section 101 requires "new," and laws of nature and physical phenomena are not new.

> specific instance; separated from embodiment.[28]

The definition in the *American Heritage Dictionary* is similar:

> 1. Considered apart from concrete existence or a specification thereof.
>
> 2. Theoretical; not applied or practical.[29]

The *Random House Dictionary* is also in accord, even using the term "abstract idea" as an example:

> 1. conceived apart from concrete realities, specific objects, or actual instances: *an abstract idea.*
>
> 2. expressing a quality or characteristic apart from any specific object or instance, as *justice*, *poverty*, and *speed.*
>
> 3. theoretical; not applied or practical: *abstract science.*[30]

There is no reason to believe the Court in *Benson* intended a different meaning, and these definitions are in complete accord with all this Court's cases. In

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[28] *Webster's Third New International Dictionary of the English Language, Unabridged*, G.&C. Merriam Company, 1965.

[29] *The American Heritage Dictionary of the English Language*, American Heritage Publishing, 1969.

[30] *The Random House Dictionary of the English Language*, Random House, 1969. (Italics in the original.)

Flook, the claimed method held to be unpatentable is not tied to any particular embodiment, and particularly is not limited to performing the method using a computer at all. The claimed computation of the alarm limit could be done, albeit inconveniently, by hand. In contrast, the patentable method claimed in *Diehr* is explicitly tied to a digital computer, both in the preamble and in the claim element that requires "providing said computer with a data base for said press." Similarly, the claims found unpatentable in *Bilski* do not require that they be embodied on a computer.[31]

The prosecution history of the Benson patent application shows that this Court's *Benson* decision correctly found that the claims were to an abstract, or unembodied, idea, placing it in line with later Supreme Court decisions on the patentability of computer-based inventions.

Just as many commentators have criticized this Court for using the well-understood term "abstract idea" as a limitation on statutory subject matter, along with laws of nature or natural phenomena, they ignore the possibility that this Court intended such an "embodiment" test. They assume that the invention in *Benson* appears to contradict this test, because claim 8 requires a "reentrant shift register" and yet was also found unpatentable by this Court.

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[31] Although the invention in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. ___ (2012), was not computer-based, the claimed invention there is also "abstract" because it is not limited to any particular embodiment.

It is doubtful that any of the critics of *Benson* have considered the prosecution history when looking at the claims to see them in the context that was before this Court. The critics simply look at the claims that were included in this Court's opinion and assume that a "reentrant shift register" is a particular hardware device, and not simply a way of indicating a particular operation to be performed regardless of any embodiment.

Because a patent did not issue from Benson's application, the prosecution history is not publicly available at the Patent Office. However, the complete prosecution history was filed with the CCPA as a "Transcript of Record" in the case and forwarded by the CCPA to this Court when certiorari was granted. The prosecution history is now stored in the National Archives, where Professor Hollaar was able to review it and make a copy that he has placed online.[32]

In the prosecution history of Benson, the applicant specifically disclaimed any embodiment limitation. On page 7 of Benson's response to the first office action (page 23 of the prosecution history), Benson's attorney states "Finally, the method represented by these claims *can also be carried out by hand*, the shifting and adding being manual." (Emphasis added.) The claims referred to include both 8 and 13 in essentially the same form as considered by this Court. Further, on page 24 of the prosecution history, Benson's attorney reiterates

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[32] http://digital-law-online.info/papers/lah/benson/.

> Concededly, applicants' methods can be implemented by a set of instructions which are used to control the operation of a computer. As noted above, they can also be implemented by circuitry which is wired to perform the function. *They can even be practiced by hand.* (Emphasis added.)

Benson's attorney made those critical admissions because he felt that the law at the time was that if a method could be carried out by hand, the invention was no longer "mental steps" and was therefore statutory subject matter. The CCPA ignored the applicant's admission that the "reentrant shift register" refers to a particular operation that can be "practiced by hand," instead substituting a definition it took from an encyclopedia,[33] thus confusing anybody trying to understand the claimed invention in *Benson* from just the opinions of the CCPA and this Court.

But although this Court discusses the Benson invention as being implemented on a digital computer, it appears that this Court was also considering the admissions made during the prosecution of the application, and not the new definition of a "reentrant shift register," when it stated

> Here the "process" claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion. The end use may ... be

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[33] *In re Benson and Talbot*, 441 F.2d 682, 687 (CCPA 1971).

> performed through any existing machinery or future-devised machinery or *without any apparatus.*[34] (Emphasis added.)

In light of the prosecution history, what was claimed in *Benson* is an abstract method like the one in *Flook*, not tied to any embodiment and certainly not to a digital computer. The simple test reconciling all this Court's decisions is that a method claim is abstract, and therefore not patentable, when the claim is "separated from embodiment" or "apart from" a particular implementation such as on a digital computer.

That Benson's claims *could* be performed by a digital computer does not make them statutory subject matter. When a claim encompasses both statutory and non-statutory subject matter, the claim is non-statutory, lest a person be able to get a patent that covers impermissible things, such as abstract or unembodied methods, by simply writing a claim that also encompasses a tangible embodiment.

This Court's rule that abstract ideas are not patentable serves an important function.

Some may feel that because "process" can be broadly read as anything that can be expressed in a series of steps,[35] there is essentially no limit on what a statutory process is. But patents have always been limited to the "useful arts,"[36] which in today's language is synonymous with "technology."

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[34] *Gottschalk v. Benson*, 409 U.S. at 68 (emphasis added)

[35] The first relevant definition in *Merriam-Webster's Collegiate Dictionary, Eleventh Edition* (2012) for "process" is "a series of actions or operations conducted to an end."

In *Benson*, this Court wisely decided not to say that a process must somehow involve "technology" to be patentable, and thereby creating unending litigation over what technology means and when a process embraces it. Instead, it continued the practice of treating statutory subject matter broadly, but saying that abstract ideas (as discussed above, those that do not claim any embodiment) are not patentable. This results in a far simpler test for determining statutory subject matter that is true to the "useful arts" requirement.

Claiming computer-implemented inventions as methods helps produce good patents.

There is a strong appeal for claiming a computer-implemented invention as a process or method.[37] Method steps are often the clearest way to describe the scope of the invention, making the claim easier for the examiner or a court to determine the applicable prior art and for someone to determine infringement. Claimed method steps also make it easier to try to advance technology by developing an alternative method for accomplishing the results of claims that follow different steps.

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[36] U.S. Constitution, Article I, Section 8, Clause 8.

[37] The terms "process" and "method" are interchangeable. See 35 U.S.C. § 100(b).

A recent book[38] posits that a major problem with patents is that it is difficult to determine what is covered by a patent, and this lack of a predictable property right produces uncertainty for developers and costly disputes that detract from the positive incentives of the patent system. The authors' research found that only in some sectors of technology, such as the pharmaceutical industry, do patents act as advertised, with their benefits outweighing their costs, while for software, the lack of clear claiming has had a definite negative effect.

Computer technology has matured considerably in the four decades since this Court decided *Benson*, with that opinion's concern about preempting all ways of doing something now highly unlikely, unless what is being claimed is such an advance over the prior art that is deserves patent protection. More likely, broad claims will be obvious in light of prior art and be unpatentable for that reason, and it is not necessary (or desirable) to use a statutory subject matter as the reason for the rejection.[39]

When tied to a computer, a method claim is definitely *not* the transformation of an abstract idea, law of nature, or physical phenomena into a patented process by merely having a draftsman attach some form of post-solution activity to a mathematical formula, as this Court warned about in *Flook*.[40] Instead, claiming a process may be the best way to meet the statutory requirement of a claim "particularly pointing out and distinctly claiming" the computer-implemented invention.

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[38] James Bessen and Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovation at Risk*, Princeton University Press, 2008.

[39] For example, even around the time of *Benson* this Court unanimously held a claimed computer-based invention unpatentable not because it was not statutory subject matter, but because it was obvious in light of the prior art. *Dann v. Johnson*, 425 U.S. 219 (1976). With hundreds of thousands of patents and publications in the computer art, such rejections of overly-broad patents are even easier.

Two important caveats regarding the simple definition of an "abstract idea."

It is important to keep two things in mind regarding this definition of an abstract, and therefore nonstatutory, idea.

First, it should not be seen as imposing any new requirement for embodiment in a machine for any process or method claim that is otherwise statutory under existing law. Process claims limited to transforming or reducing an article to a different state or thing, recognized since *Cochran v. Deener*,[41] remain statutory subject matter because they are clearly not "abstract ideas."

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[40] For example, consider United States Patent 3,568,156, "Text Matching Algorithm," granted March 2, 1971, and assigned to Bell Telephone Laboratories. It discloses both an implementation as a computer program and an unlikely, but clearly statutory, implementation as circuitry, and then writes the claim in "means for" language which covers whatever is described in the specification.

[41] 94 U.S. 780 (1877).

Second, as discussed above, just because a method is explicitly limited to a computer embodiment, and is not an "abstract idea" but is statutory subject matter, does not mean that the claim is patentable. The claim must also be novel, non-obvious, and commensurate with what is disclosed in the specification. A problem with patents on computer-implemented invention is *not* that they are claimed as a method, but that they may claim more than what was disclosed in their patent application or what they claim is obvious in light of the prior art.

Restating this test for when a method claim is abstract will give a second chance for patents that meet the requirements of disclosure and non-obviousness.

If this Court clarifies that a claimed method limited to one or more tangible embodiments means that it is not an unpatentable "abstract idea," then there should be little difficulty for a patent owner to limit non-statutory method claims to computerized embodiments to make the claims statutory by requesting reissue of the patent with new, statutory claims.

The patent statutes provide for the reissue of defective patents.

> Whenever any patent is, through error, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than

> he had a right to claim in the patent, the Director shall, on the surrender of such patent and the payment of the fee required by law, reissue the patent for the invention disclosed in the original patent, and in accordance with a new and amended application, for the unexpired part of the term of the original patent. No new matter shall be introduced into the application for reissue.[42]

There is a limitation on this, however.

> No reissued patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent.[43]

Clearly, a claim that is limited to an embodiment is narrower than a claim not so limited. But if the Court were to require a different test, it might not be possible to rewrite the claims so that the new claims are strictly narrower than the original claims.

Reissue is not automatic. Instead, USPTO regulations prescribe that the reissue application "will be examined in the same manner as a non-reissue, non-provisional application, and will be subject to all the requirements of the rules related to non-reissue applications."[44] That means that the application will be examined to determine that the specification enables the claimed implementation, and that it is novel and non-obvious in light of the prior art.

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[42] 35 U.S.C. § 251(a).

[43] 35 U.S.C. § 251(d).

Because there is normally a two-month delay period after the reissue request is announced in the USPTO's *Official Gazette*, "members of the public may have time to review the reissue application and submit pertinent information to the Office before the examiner's action."[45] This submission of prior art by parties affected by the reissued patent means that the examiner can have a better view of the prior art than during the initial examination of the patent.

Computer-implemented systems are clearly patentable "machines."

The answer to whether a computer-implemented invention is statutory subject matter when claimed as a computer[46] or data processing system should be clear. Of course, it is a machine. Babbage's analytical engine, perhaps the first programmable computer, used gears and similar mechanisms, reading its instructions off a set of cards particular to a given problem. Nobody would question whether it was a

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[44] 37 C.F.R. § 1.176(a).

[45] *Manual of Patent Examining Procedure (MPEP)*, section 1441.

[46] While the term "computer" once meant a person who carried out calculation by hand, few today know that old meaning and instead think of it as short for an electronic digital computer.

"machine," even though what it did could be changed by supplying a new program.

Certainly a computer system is no more a "law of nature" or a "physical phenomena" than any other electronic device. And it is hard to think of any credible definition for an "abstract idea" that includes a tangible computer system.

A computer program running on the embedded processor on an appliance such as a washing machine turns that embedded processor into a special-purpose washing machine controller,[47] replacing the mechanical controller of past washing machines. Because the power and flexibility of the embedded controller allows the washing machine to perform functions that would be impractical using a conventional controller with motors and gears, the embedded controller would be patentable if novel and non-obvious. Babbage's analytical engine, impractical to implement given the mechanical technology of his day, has become today's computer, practical because the gears have been replaced by electronic circuits.

While it is always possible to implement any technique that runs on a general-purpose computer as special-purpose hardware, it is often impractical for any but the simplest techniques. This is why as more functionality is desired, programmed embedded general-purpose processors are replacing specialized electronic circuitry, just as such circuitry replaced mechanical devices.

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[47] "We have held that such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994). This holding is in line with well-accepted computer science principles, such the programming of a computer to produce a Java "virtual machine" to run web-based applications.

Again, note that a computer-implemented invention claimed as a machine does *not* mean that the claim is patentable. Rather, it only means that the claim has passed the statutory subject matter hurdle, and the requirements of novelty, non-obviousness, and sufficient disclosure must still be considered. Having a simple test, well-grounded in technology, such as "a computer is a machine and therefore statutory subject matter" will shift the time spent trying to determine whether the claim is statutory to better examining the application to assure that patent claims are not granted on something that is obvious or outside of what is taught in the patent application.

Departing from the actual language of a claim can make the determination of whether an invention is statutory completely arbitrary.

When determining whether something is statutory subject matter, this Court has always looked to what is actually being claimed as the invention, unlike in this case in which the Federal Circuit explicitly treated machine claims as if they were instead for a method, and then held that those hypothetical method claims were not statutory subject matter.

Compounding the problem, the Federal Circuit never gives the language for its hypothetical method claims, and simply states that they "mirror Alice's method claims."[48] But a comparison of the cited system claim[49] to the cited method claim[50] shows that while they both are, unsurprisingly, directed to the same general invention, the system claim is clearly *not* a paraphrase of the method claim. Without knowing what the Federal Circuit considered as the language of the hypothetical method claim the court used to determine whether the subject matter was an abstract idea, it is impossible to say that the hypothetical is a patentable claim as in *Diehr* or an unpatentable claim as in *Flook*, since as discussed below, those claims are very similar.

Under the Federal Circuit's *Alice* holding, whether a system claim is patentable depends on how it is reframed as a method claim, something completely arbitrary especially when the hypothetical method claim isn't even provided.

It is not hard to see how machine claims for many inventions that are not computer-based can be rewritten as method claims, and then depending on whether that rewriting is "abstract" or not, those machines are no longer statutory subject matter. For example, using the Federal Circuit approach, claims to the circuitry for an automobile's warning of a car door that is ajar could be considered a "method for warning that a car door is ajar" and perhaps then a nonstatutory "abstract idea." Clearly, the Federal Circuit approach is wrong.

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[48] 717 F.3d 1269, 1289.

[49] Claim 1 of the '720 patent, *Id.*, at 1289.

[50] Claim 33 of the '479 patent, *Id.* at 1285.

In the *Myriad* decision[51] last term, this Court was able to come to a unanimous opinion by looking at what was actually being claimed and recognizing that some claims were unpatentable because they covered naturally-occurring human DNA but some claims were patentable because they covered man-made cDNA, rather than by simply considering all the claims as to "human DNA." Similarly, in this appeal, this Court can considerably simplify the analysis and yield a clear and technically-sound result by observing that some of the claims in this case are for methods, which may or may not be nonstatutorily "abstract," and some of the claims are "machines" which are clearly statutory.

The effort to find media storing computer programs as statutory articles of manufacture has stifled the development of patent law to address computer-based inventions.

The saga of the patentability of media storing a computer program shows the problems that result when concentrating on whether something is statutory subject matter and neglecting the development of patent law in more directly-applicable areas, such as secondary infringement.

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[51] *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. ___ (2013).

Whether something is an article of manufacture would not be a question with respect to computer-implemented inventions, except for patent owners concerned that those responsible for the infringement of a computer-implemented patent would not be direct infringers if the invention were claimed as either a machine or a method. Only the end users who receive and install the distribution media (originally, floppy disks) would directly infringe when they load the program to create the claimed machine or when they actually run the program to practice the claimed method. While the company supplying the media containing the infringing program should be liable either as a contributory infringer under 35 U.S.C. § 271(c) or for inducing infringement under § 271(b), there were concerns about whether those provisions would be applicable.[52]

Rather than work to clarify the law of what constitutes contributory infringement or inducement of infringement for computer-based inventions (either by bringing cases that raise the point or asking Congress to address it statutorily), applicants began to file article of manufacture claims. These simply claimed a storage medium that contained a computer program that performs a specified method. The Patent Office regularly rejected such claims until there was an appeal to the Federal Circuit, which was remanded when the Patent Office indicated that it would start allowing such patents.[53]

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[52] As computer program distribution has shifted from tangible floppy or compact disks to downloading from the Internet, this form of claim has become less important. The trick cannot be extended to Internet distribution because of the Federal Circuit's holding in *In re Nuitjen*, 515 F.3d 1361 (Fed. Cir. 2008) that intangible signals are not articles of manufacture.

The problem with this article-of-manufacture trick is that it sweeps more than is wanted into statutory subject matter. Just as a compact disk containing a computer program is a statutory article of manufacture, so would be a compact disk of music. Former Chief Judge Archer warned about this in his dissent in *Alappat*.[54] And because patent law does not contain copyright law's fair use and independent creation defenses, that person would have a lock on the expression stored on the disk for the length of a patent.

Since then, the Patent Office has issued examination guidelines[55] that allow such claims as long as the corresponding method claims are novel and non-obvious and the information stored on the medium was deemed "functional." a distinction believed by the Patent Office to be necessary to prevent allowing patents on media whose only novelty is the expressive content of a book or song that the media holds.[56]

Unfortunately, the guidelines draw a distinction where none exists, both in technology and in patent law. A compact disk is an article of manufacture, no matter what the disk holds and how its contents are eventually used. It is a man-made object, storing data in the same fashion (in a simple view, as "zeros and ones"), regardless of whether the data will eventually be used to program a computer, show a movie, or play a song. The only difference in the data stored on the disk is how it is later used, not anything related to either the data or the medium.

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[53] *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995).

[54] 33 F.3d 1526, 1554 (Fed. Cir. 1994, Archer, C.J., dissenting).

[55] 61 Fed. Reg. 7478 (1996).

[56] The leading case on the "printed matter doctrine" is *In re Gulack*, 703 F.2d 1381 (Fed. Cir. 1983).

The debate whether a tangible computer-readable medium, such as a floppy disk, is a statutory article of manufacture has short-circuited cases that would have developed the law in important areas, such as:

- Whether a computer program capable of doing things that do not infringe as well as performing the patented method might be considered as having a "suitable non-infringing use" and therefore the sale of the computer program may not be contributory infringement even though the program was "especially made or especially adapted for use in an infringement" as required by § 271(c) for contributory infringement.

- Whether a medium storing a computer program in exactly the same way that it stores any other program be considered non-obvious simply because the computer program will perform a different task after it has been loaded into a computer.

While answering such questions are well beyond the scope of this case, by recognizing that a tangible storage medium is clearly a statutory article of manufacture, just like a machine, even if the medium stores a computer program, this Court can enable the development of the law to address the real questions of when a storage medium containing a program is nonobvious in light of similar program storage on the same media and regarding secondary infringement of a computer-based invention claimed as either a machine or an embodied method.

Storage media are clearly statutory articles of manufacture. They are "made by man"[57] and not a law of nature, physical phenomena, or abstract idea. They do not become non-statutory simply because of what they are storing. Like trying to determine whether machine or method claims are statutory, the effort in determining whether an article of manufacture claim is statutory detracts from the more important effort in determining novelty, non-obviousness, and commensurate disclosure.

By allowing all but abstract, unembodied methods, this Court can be true to its past opinions and not harm those patent owners who depended on them.

In her dissenting-in-part opinion below, Judge Moore expressed concern over how the Federal Circuit was interpreting this Court's "abstract idea exception," noting that

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[57] *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (citing S. Rep. No. 82-1979, at 5 (1952) and H.R. Rep. No. 82-1923, at 6 (1952)).

> Today, several of my colleagues would take that precedent significantly further, lumping together the asserted method, media, and system claims, and holding that they are all patent-ineligible under § 101. Holding that all of these claims are directed to no more than an abstract idea gives staggering breadth to what is meant to be a narrow judicial exception. And let's be clear: if all of these claims, including the system claims, are not patent-eligible, this case is the death of hundreds of thousands of patents, including all business method, financial system, and software patents as well as many computer implemented and telecommunications patents.[58]

Judge Moore goes on to observe that the opinion below would

> render ineligible nearly 20% of all the patents that actually issued in 2011. If the reasoning of Judge Lourie's opinion were adopted, it would decimate the electronics and software industries. There are, of course, software, financial system, business method and telecom patents in other technology classes which would also be at risk. So this is quite frankly a low estimate. There has never

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[58] *CLS Bank v. Alice*, 717 F.3d 1269, 1313 (Fed. Cir. 2013).

> been a case which could do more damage to the patent system than this one.[59]

But, as noted above, this damage can be mitigated by this Court.

First, this Court should state that in making statutory subject matter determinations, it is improper to lump all claims into the method category unless that is the specific form of the claim, especially when the lumping involves arbitrarily creating a hypothetical claim not made by the inventor. Patent claims are method claims only when that is the specific statutory class of the claim. Furthermore, computers are clearly man-made objects, and machine claims for them recite statutory subject matter. But that does not mean that a computer-implemented invention is patentable just because it is claimed as a machine. The implementation of an old technique on a computer using standard techniques is clearly obvious, even if the technique has never been computerized before. Other statutory requirements for patentability must be considered.

Second, this Court can clarify that a patent claim not limited to one or more tangible embodiments is an "abstract idea." In accord with the *Benson-Flook-Diehr* trilogy recently confirmed in *Bilski*, as discussed above, a claim with no specified embodiment, perhaps even being done by hand, is not patentable subject matter. But again, simply tying a method claim to a machine does not make it patentable. As with machine claims, method claims must be limited to that which is new, non-obvious, and adequately disclosed, the other key tests for granting or invalidating a patent.

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[59] *Id.* at 1313, fn. 1.

Conclusion

This Court should use this case to restore proper emphasis on when something should be patentable – when an adequately-disclosed invention is a non-obvious advance over the prior art – by adopting the clear and simple test for when a claim to a computer-implemented invention is statutory subject matter by using distinctions that make sense in the underlying technology.

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BRIEF

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Supreme Court of the United States

ALICE CORP. PTY. LTD,
Petitioner,

v.

CLS BANK INTERNATIONAL ET AL.,
Respondents.

On Writ Of Certiorari to the
United States Court Of Appeals
For The Federal Circuit

BRIEF OF *AMICUS CURIAE* IEEE-USA IN SUPPORT OF NEITHER PARTY

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STATEMENT OF INTEREST OF *AMICUS CURIAE* [1]

IEEE-USA is an organizational unit of The Institute of Electrical and Electronics Engineers, Inc. (IEEE), the world's largest organization for technical professionals, and a leading educational and scientific association for the advancement of technology. IEEE-USA supports the nation's prosperity and competiveness by fostering technological innovation for the benefit of all, including more than 200,000 U.S. engineers, scientists, and allied professionals who are members of the IEEE.

As part of its mission, IEEE-USA seeks to ensure that U.S. intellectual property law serves to promote the progress of science and the useful arts in a way that is consistent with the principles set forth by our Nation's Founders. IEEE-USA's members have a substantial stake in the United States patent system. Our membership includes inventors who create and use cutting-edge technology, researchers who are involved in scientific discovery, authors of journal articles in the fields of electronics and computer science, entrepreneurs, and employees of firms that acquire, license, and market patented technology. Because of the stake that IEEE-USA membership has in the outcome of this case, and because of its public interest in promoting activities in the fields of electronics and computer science, IEEE-USA is fully aware of the need for pioneer developers of technology to be able to capture the value of their inventions, as well as the need of future market entrants to be able to clearly identify where there is still room for development of follow-on technologies. Because of such awareness, IEEE-USA fully understands the need for a balanced patent system. IEEE-USA submits that its broad experience and balanced perspective will be helpful to this Court in its deliberations. IEEE-USA has filed a number of *amicus* briefs in a number of cases, and it is notable that this Court adopted the "foreseeable bar" standard suggested by IEEE-USA, in its decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.,* 535 U.S. 722 (2002).

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[1] Pursuant to Supreme Court Rule 37.6, counsel listed on the cover states that this brief was authored by *amicus curiae* IEEE-USA and reviewed by counsel, and that counsel for a party did not author this brief in whole or in part. Nor did counsel for a party make a monetary contribution intended to fund the preparation or submission of the brief. In addition, all parties have consented to the filing of this *amicus* brief, and their consent letters are on file with the Clerk's office as of December 11, 2013.

SUMMARY OF ARGUMENT

Computer-implemented inventions as a class are too important to deny patent protection. There are nearly 1 million software-related U.S. patents in force today on which the public relies. In this case the Court is asked to decide whether computer-implemented inventions are patentable under 35 U.S.C. § 101. On both legal and technological grounds, IEEE-USA believes the answer is clearly yes.

While the parties and other *amici* will cover sufficiently the law and patent policy, IEEE-USA's expertise is in the technological innovation at issue in this case. On the basis of this expertise, IEEE-USA submits that phrases such as "software patent" or "patent on software" are technologically inaccurate and misleading. Thus it is necessary to present the technological facts about software-implemented inventions, which the IEEE-USA is uniquely qualified to explain. In turn, this explanation will make clear why these modern-day inventions are exactly the type of inventions that the patent system was created 224 years ago to protect. See *Bilski v. Kappos*, 130 S.Ct. 3218 (2010) (stating that Section 101 of the U.S. patent law is a "dynamic provision designed to encompass new and unforeseen inventions").

Ultimately, this brief is necessary given widespread misunderstanding among lawyers, judges, and commentators about the nature of the innovations produced by the economically dynamic and vibrant software industry—an industry made possible in part by the intellectual property protections afforded to its innovators.

ARGUMENT

I. The Court's jurisprudence includes recognition that the broad scope of patent eligible subject matter encompasses computer-implemented inventions

The Supreme Court has held that the categories of patent-eligible subject matter recited in Section 101 are broad in their scope and limited only by three important judicially created exceptions. That is, "[l]aws of nature, natural phenomena and abstract ideas" are excluded from patent eligibility because such fundamental discoveries represent "the basic tools of scientific and technological work" *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972). Thus, the Court has concluded that abstract ideas are to be treated as being equivalent to laws of nature and natural phenomena. Accordingly, patent-eligible inventions cannot include representations of relationships that always existed, as well as things that are purely of nature and not made by man. *Parker v. Flook*, 98 S.Ct. 2522, 2527 (1978) and *Diamond v. Chakrabarty*, 100 S.Ct. 2204, 2207 (1980). However, the method or means of application of a scientific principle, law of nature, or abstract idea, for the production of a useful result, is a proper subject for a patent.

In this regard, this Court's decision in *Diamond v. Diehr*, 450 U.S. 175 (1981) taught that in a § 101 inquiry, each element of an invention is measured against a § 101 standard, that is, whether there is at least one element that is neither *"abstract"* (purely in the human mind) nor *"natural"* (unaided by human intervention). *Diehr* explained that the analysis for the *kind* of invention eligible under § 101 is "wholly apart" from the analysis for whether the invention or any element is *new* and differentiated from the prior art.

Instead, the *Diehr* Court noted that Diehr's claim—*as a whole*—applied well-known scientific and abstract algorithm concepts to *a new context*, an improved and practical process for curing rubber. *Diehr*, 450 U.S. at 184. In essence, any single limitation that could not be performed in the human mind or by nature unaided by human intervention—*e.g.*, measuring a temperature of a physical process, or opening an industrial mold press—converted Diehr's recognition of applicability of an "abstract" principle, such as an algorithm, into a patentable *application* of that principle. The *Diehr* Court expressly held that the old-or-new status of individual components of Diehr's invention was *irrelevant* to a § 101 analysis. *Id.* at 193 n. 15. However, because Diehr's claim recited language that could not be performed by nature unaided, and could not be performed in the "abstract" by the human mind, the claim *as a whole* satisfied § 101. *Diehr*, 450 U.S. at 191.

As pointed out in this Court's recent decision, *Bilski v. Kappos*, 130 S.Ct. 3218 (2010), Section 101 of the U.S. patent law is a "dynamic provision designed to encompass new and unforeseen inventions." *Id.* at 3227, citing. *J. E. M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135, 122 S.Ct. 593, 151 L.Ed.2d 508 (2001). As this Court recognized in *Bilski*, a physical-based "machine-or-transformation test may well provide a sufficient basis for evaluating processes similar to those in the Industrial Age —for example, inventions grounded in a physical or other tangible form. But there are reasons to doubt whether the test should be the sole criterion for determining the patentability of inventions in the Information Age." *Id.*

IEEE-USA notes this Court's cautionary approach in *Bilski*; that a "machine-or-transformation" test may be too restrictive for an "Information Age," computer based economy. As IEEE-USA will present in the next section, a machine-or-transformation test is certainly inappropriate, unless "transformation" is interpreted to include the kinds of physical transformations that are the foundation of digital computers and microprocessor based technologies.

Further, IEEE-USA urges the court to consider reliance by industry, dating from at least the Federal Circuit's opinion in *In re Alappat*, 33 F. 3d 1526 (Fed. Cir. 1994) (en banc), on the patentability of computer-implemented inventions. In that decision, the Federal Circuit held that a computer program "is not a disembodied mathematical concept which may be characterized as an 'abstract idea.'" *Id.* at 1544. A computer program, or a sub-program, according to that Court, is the digital equivalent of "a specific machine." *Id.* Thus, a software program, when combined with the hardware of a computer, qualifies as an invention of a digital "machine." For example, a word processing program is a digital equivalent of a typewriter – what the former does in computerized digital format the latter does in a mechanical, analog format. *See* Adam Mossoff, "A Brief History of Software Patents (and Why They're Valid)" (Sept. 2013), at 6, http://cpip.gmu.edu/wp-content/uploads/2013/08/A-Brief-History-of-Software-Patents-Adam-Mossoff1.pdf.

The importance of the *In re Alappat* decision for the industry was greatly magnified by decisions shortly thereafter. In the case of *Lotus Dev. Corp. v. Borland Int'l, Inc.*, the First Circuit held that Lotus could not copyright its pull-down menus because these were a functional "method of operation" (*i.e.*, a utilitarian design, and not an expressive text capable of receiving copyright protection). *Lotus*, 49 F.3d 807, 815 (1st Cir. 1995). This Court (as a result of a 4-4 split) affirmed the First Circuit ruling. *Lotus*, 516 U.S. 233, 116 S. Ct. 804; 133 L. Ed. 2d 610 (1996).

As this Court has repeatedly recognized, when contrasting patents against other IP regimes, such as copyright and trademark, "it is the province of patent law" to secure "new product designs or functions." *Qualitex Co. v. Jacobsen Products Co., Inc.*, 514 U.S. 159, 164 (1995); *Elmer v. ICC Fabricating*, 67 F.3d 1571, 1580 (Fed. Cir. 1995) ("patent law, not trade dress law, is the principal means for providing exclusive rights in useful product features"). *See also Baker*, 101 U.S. at 102 ("[T]he exclusive right to the art or manufacture … is the province of letters-patent, not copyright").

Other than trade secrecy, an option that is often not available (e.g., if use of the invention is inherently disclosing to the public or if, as is common today, employee turnover is high), a patent is essentially the only practical option for securing engineering innovations as embodied in or implemented using a computer program.

II. Computer-implemented inventions that use mathematical algorithms, and/or implement business methods, are like any other real, and physics-based, technology

IEEE-USA submits that phrases like "software patent," or a "patent on software," are technologically inaccurate and misleading. IEEE-USA fully supports the framing accepted by the Court, that the kind of inventions at issue here are best described as "computer-implemented inventions," but wishes to assist the Court with further clarification of the phrase.

IEEE-USA believes that it is in a unique position to contribute technical expertise to the debate over so-called "software patents." The field of electrical engineering has been the basis of virtually all computing hardware since the field of general-purpose computing's very beginnings in the 1940s. The IEEE, through its predecessor organizations (the Institute of Radio Engineers and the American Institute of Electrical Engineers), has been an important part of electrical engineering's development since 1884.

II.A Equivalence of software and hardware

From the time of its founding, and up to today, the IEEE has continued to adapt to the field's many changes. Among the field's most important trends, that started from at least the 1970s, and is continuing to present day, is the increasing importance of the digital side of electrical engineering. This growth of importance is due primarily to two factors:

1. With each new generation of digital hardware technology, general-purpose computing hardware has become faster and/or less expensive. (Each new generation of digital hardware can also possess additional or alternative advantages, such as greater miniaturization and/or lower power consumption. For clarity of exposition, we have limited our focus to increased speed and/or lowered cost.)

2. The principle of equivalency, that holds that special-purpose programming of general-purpose hardware can be made equivalent to special-purpose hardware. (The equivalency can be made exact when the conversion is from digital special-purpose hardware to special-purpose programming of general-purpose hardware. On the replacement of analog special-purpose hardware, there will always remain situations, such as transducing by sensors, where analog hardware will remain essential. Also, quantization, a necessary step for substitution with digital techniques, is inherently an approximate representation, of continuous real world values.)

With each new advance of general-purpose hardware, on the frontiers of processing speed and/or affordability, additional possibilities for utilizing the principle of equivalency emerge as commercially viable. Thus, over the decades, there has been a continual trend, no less vibrant today, of re-implementing functionality of a special-purpose hardware solution as an equivalent functionality using special-purpose programming of general-purpose hardware.

Also, as general-purpose hardware becomes more common, economies of scale emerge that further encourage this trend. It is this trend, towards increased use of the principle of equivalency, which has been the main driving force behind the appearance, before this Court today, of a case such as *CLS Bank International v. Alice Corp. Pty. Ltd.*

An example technology, with extensive current investment in re-implementing functionality with software, is the field of wireless communication. Since the earliest days of radio-frequency technology, which began about 100 years ago, radio signals were modulated (*e.g.*, varied in frequency, amplitude, or phase) using analog circuitry. This is because digital devices, even when they became available, were historically unable to operate at radio frequency in an economically viable way. Currently, however, there is a great deal of investment in re-implementing radio signal modulation, with general-purpose digital hardware programmed to run special-purpose software. (Such software is called "embedded firmware" or "microcode." *See* Fanny

Mlinarsky, "Multimode wireless devices: It's the software, stupid!" *Mobile Handset DesignLine TechOnLine Community website*, October 13, 2009, http://www.octoscope.com/English/Collaterals/Articles/octoScope_MultimodeSoftware_DesignLine_20091013.pdf.)

Another and related example is the ubiquitous presence of software-related inventions in smart phones, as documented by economists at the U.S. Patent and Trademark Office ("PTO"). *See* S. Graham and S. Vishnubhakat, "Of Smart Phone Wars and Software Patents," 27 *Journal of Economic Perspectives*, 67 (Winter 2013), ("PTO 2003"). This paper states that the PTO reviewed all 73 patents involved in some of the high-profile litigation, among four major firms in the smart phone industry: Motorola, Microsoft, Apple, and Samsung. The PTO found that 65 of the patents (9 out of 10) included at least one software-related claim. PTO 2003 at 73.

The functional equivalence, between hardware and software, means that the choice, of how much of a particular system to implement with each, is really just a practical, market-driven, design issue. A primary driver, towards increased use of software, is the speed with which software can be written, and rewritten. Implementing as much as possible in software is almost always the most cost-effective way to reduce time-to-market. Once on the market, in order to stay competitive, products often need frequent updating, with new or modified features. An implementation in software almost always provides the quickest and most cost-effective route, by which such updates can be accomplished.

The main advantage of a hardware implementation of an algorithm (relative to software) is that it is almost always faster. If the extra speed is of paramount importance, the extra time-to-market, to produce a hardware implementation, becomes the economically sensible choice. An example area, where speed can be the predominant factor, is real-time video processing. This is because each frame of a video represents a large amount of data (at least a megapixel, for U.S. HDTV), and, in order that any motion represented by the video appear realistic (*i.e.*, take place in real time), the frames must be produced as a continuous, steady stream (for U.S. HDTV, frames must be output at a constant rate of 30 per second).

Further, as will be explained below, there are additional important reasons why the distinction, between a so-called "software-implemented system" and a so-called "hardware-implemented system," is really very artificial. As will be explained below, every general-purpose computer is ultimately based on specialized hardware. The general-purpose character of general-purpose computers results from the fact that, eventually, all such systems can perform the same functionality – albeit at very different speeds. (Speed differences are, of course, very important in practical applications.)

For this reason, every "software" solution includes at least some special-purpose hardware. Conversely, many "hardware" solutions contain at least some software. Also, to the extent special purpose hardware solutions are still needed, there has been a long term trend towards making its design more like the writing of software. Rather than working with wires and circuits, today's hardware designer is much more likely to be writing programs, or "software," that is automatically translated into a circuit. The languages in which such hardware is written can be the same as those used for software (*e.g.*, the "C" programming language). More frequently, the hardware is programmed in a language, called a "Hardware Description Language," specifically designed for expressing hardware.

A practical design choice, like choosing how much to implement in software and how much in hardware, that is constantly changing and evolving due to market conditions, should not be a controlling factor (or a factor at all) as to whether the implemented method is patent-eligible.

II.B The execution of software depends on real, physics based, processes

A computer is always a real physical system. It shares many of the same qualities of any other physical system. For example, research into the fundamental connections between physics and information processing has shown that *any computation*, if it is to be performed in less than an infinite amount of time, *must consume at least some energy*.

Another way of saying this is that, in order to "calculate" or, more correctly, "compute," a computer must make changes to its physical state. Being able to reliably change state is a general engineering problem that has been addressed, and continues to be addressed, using engineering solutions.

Almost all computer design, at least to date, has been of a kind that is very intolerant of errors in the hardware. Even a few "flipped bits" (*i.e.*, bits of data that, for some physical reason, spontaneously change from "1" to "0" or from "0" to "1"), among the billions of bits that are often involved in executing a typical computer program, can cause that program to "crash" (*i.e.*, be forced to totally end its current execution).

The choice of binary arithmetic, as the basis for almost all current computers, was not driven by mathematics. Binary arithmetic was chosen because it can be implemented, entirely, with very simple on-off switches, and because on-off switches can be made extremely reliable.

It is a precept of engineering design that one can minimize the opportunities for errors by minimizing the number of operations or steps in any system or process. Accordingly, when seeking to give a physical representation to numbers, it is generally most reliable if the physical system used undergoes the least number of physical transformations. Binary arithmetic reduces that number of transformations to the least possible: two.

II.B.1 Every bit of information, stored in a computer, depends on a physical device

Every "bit" of information, in every binary-based computer system, is really only a particular form of physical device, capable of changing between one of two physical states.

Over the decades, a vast array of physical devices have been designed, for storing a bit of information for use by general-purpose computers. The following is only a small sample of the types of physical storage devices.

Hard Drives: The "hard drive" of most computers is still based upon magnetic technology. In a magnetic memory technology, each bit of information stored is represented by the direction at which a small item of magnetic material is magnetized. In a hard drive, the magnetic material is organized into the shape of a "disk" or "platter," so that it can literally be spun in a circle.

Digital memories based on magnetic technology have been long known to have the following advantage: they are referred to as "non-volatile." This means that, once a small item of magnetic material has been magnetized in a particular direction, it will hold that magnetization for a very long time (*e.g.*, at least years and often decades). A disadvantage of magnetically-based memories is generally their relatively slow speed of access.

RAM: The "RAM" (or Random Access Memory) of most digital computers is currently based upon the principle of charge storage. Each bit of information stored in a RAM is based upon whether a tiny amount of electric charge is, or is not, stored, on a tiny piece of electrically conductive material.

A well-known disadvantage of this type of RAM is its volatility. This is because the electric charge, once stored, will tend to "leak off" quickly (*e.g.*, within seconds). For these types of memories, the way information is continuously kept, for the hours or days a computer may continuously operate, is by a constant scanning and "refreshing," where needed, of each electric charge stored. This type of RAM is often called "Dynamic" RAM, or DRAM, because, unlike magnetic memories, it must constantly be refreshed in order to maintain its contents.

Microprocessor Chip: A microprocessor chip, which forms the heart of such things as personal computers (*e.g.*, desktops, laptops, and tablets), will include storage that needs to be particularly fast. Each bit of such storage can be accomplished with a kind of circuit referred to generally as a "latch" (or "flip flop").

The basic principle of a latch is as follows. A latch has two main modes of operation, which we shall refer to as "storage mode," in which the latch maintains the content already written into it, and "write mode," during which the contents of the latch can be changed. In storage mode, the latch maintains its content (which is either a "0" or a "1") through use of a self-reinforcing feedback loop. In particular, the output of the latch is fed back into its "feedback" input. For example, if a "0" is currently stored in the latch, the "0" output of the latch is fed back into its feedback input, and that feedback causes the latch to continue to output a "0." A "1" is stored in the latch in the same way, except the signal, which forms the feedback, is of an opposite polarity. Because of the self-reinforcing feedback, so long as power is supplied, a latch can retain, indefinitely, the bit of information that has been stored.

In write mode, the feedback loop is temporarily broken. Because of this, the latch's output is able to provide the same bit of information present at the latches "data" input. When the transition back to storage mode is made, the latch will retain (or remember) the data present at the latch's data input, because of the re-establishment of the feedback loop.

The net result is that changing the contents of a latch is actually a physical transformation, of the polarity of its feedback signal.

II.B.2 The special-purpose hardware of general-purpose computers

Thus far has been described, as a physical system, the most basic capability of any information processing device – the ability to store information. We will now address the three basic kinds of special purpose hardware necessary, in any so-called "general purpose" computer, for making use of the information stored.

First, special-purpose hardware is needed for determining how a pattern of bits of information, stored in an area of the computer referred to as the program (or algorithm) store, are recognized (or interpreted) as a particular kind of "instruction" to be performed (*e.g.*, an instruction to "add" two numbers). Second, some kind of sequencing hardware is needed, for determining an ordering by which instructions are executed. This ordering is often accomplished by a special-purpose item of digital hardware called a "program counter." In addition, the instruction set for a computer almost always includes instructions that change the order in which future instructions are executed. Third, special-purpose hardware is needed to actually perform the operation specified by an instruction. The two main types of operations, performed by an instruction, can be referred to as "mathematical" or "flow-of-control." As the name suggests, mathematical operations perform some kind of mathematical function or operation. The bits operated on, by mathematical instructions, are stored in an area of the computer referred to as the "data" store. The bits of a data store are often called data "variables" or "records." In contrast, flow-of-control operations change the sequencing, according to which future instructions are executed.

An example mathematical operation is performed by the above-mentioned "add" instruction. This instruction requires a special-purpose item of hardware, called an "adder," to actually perform the addition. Some instructions will perform both a mathematical operation and a flow-of-control operation.

To provide a concrete example, of where the program and data stores of a computer may reside, each can be a region of "main memory" (with main memory being implemented by the RAM technology discussed above). It should be noted that both the program store and data store could be designed to utilize the same (or overlapping) regions of a single main memory, as a matter of design choice. Thus, so-called "data" of the data store, which is operated upon in response to program-store instructions, can later be interpreted, by the computer, as instructions.

Regardless of the operation type, the operations performed by a single instruction are very simple. It is rare to find a general-purpose computer where any of the hard-wired mathematical operations go beyond the basic operations of arithmetic. Many operations are so simple, they are hard to even understand as representing the "processing" of data. For example, many instructions just have the net effect of copying an item of data, from one region of the data store to another.

The total set of instructions, that are actually hard-wired into a particular general-purpose computer, is called the computer's "instruction set." Thus, at its most basic (or hard-wired) level, the capabilities of a general-purpose computer are extremely primitive and simple.

Everything else about a general-purpose computer, that makes it easier for humans to use, is a result of "software." The "intelligence" or "abstraction" abilities, provided by such software, are simply a result of vast numbers (*e.g.*, millions) of instructions in the program store, physically processing vast numbers (*e.g.*, billions) of bits in the data store.

For example, many people have heard of IBM's "Watson" computer, which appears to be able to play the game of "Jeopardy!" in many cases better than a human. Most people would probably call this a kind of "intelligent" behavior. However, such intelligent behavior is still relatively uncommon, and most programs are important not because they appear to be "intelligent," but because they provide a level of "abstraction," when dealing with a particular task, that allows humans to work faster. Another way of saying this is that the computer does those parts, of accomplishing a kind of task, that a computer is particularly good at (*e.g.*, crunching lots of numbers through complex equations), leaving the human to focus on those parts of a task in which human intelligence provides the greatest "value add."

II.B.3 What is "general," about a general-purpose computer?

Even though every general-purpose computer is based upon a particular specialized set of choices for its hardware configuration (*e.g.*, such as the particular instructions included in its hard-wired instruction set), all such computers are referred to as "general-purpose" for the following reason: as long as a few well-known basic capabilities are included in the hardware of a computer design, every general-purpose computer can, *eventually*, perform any of the operations or computations of any other general-purpose computer. Remarkably, it has been shown that the vast array of potential differences in specialized hardware and specialized instruction set, possible when designing a general-purpose computer, amount only to *differing the speed*, at which certain general-purpose computers can accomplish certain kinds of algorithms, in comparison with other kinds of general-purpose computers accomplishing other kinds of algorithms.

Most users of a type of device they would call a "personal computer" (as mentioned above, these include desktops, laptops, and tablets) have an intuitive understanding that their device has extremely wide (or "general-purpose") applicability, due to the fact that tens of thousands of "apps" (*i.e.*, separate items of application software) are typically available for them.

For purposes of this *Amicus* Brief of IEEE-USA, however, the phrase "general-purpose computer" has been used in its broadest sense, as referring to the core internals of how a device operates, and not to the externals, as a user or consumer may experience them. For example, there are many products that a consumer experiences as special-purpose, but that are really, internally, a combination of general-purpose hardware with special-purpose programming. Such combinations are often referred to as "embedded systems" or "microcontrollers." Even now, a typical office, home or automobile contains many such embedded systems, each of which is performing, from the user's perspective, a limited repertoire of functionalities.

II.C Claim 33 of the '479 patent

As an example of the foregoing discussion (of the physics and special-purpose hardware of program execution), changes in state occur when carrying out the steps of claim 33 of Alice's U.S. Patent 5,970,479 ("the '479 patent"), on which particular focus has been placed. The steps of claim 33 provide clear evidence that the method described therein has been sufficiently applied (although IEEE-USA takes no position as to whether the '479 patent should be found valid, with respect to statutory criteria other than §101).

Step (a) requires establishing a shadow credit record and a shadow debit record for each stakeholder party. This requires that a computer – the computer of the supervisory institution – create data files assigned to individual stakeholder parties, and change each to an appropriate state. The data files may be stored in main memory or on an external mass storage device (such as a hard drive).

Similarly, step (b) also requires the supervisory institution computer to perform machine operations. These include initializing the shadow credit record, and the shadow debit record, with bit values corresponding to a start-of–balance value. The start-of-balance values are obtained from each exchange institution. These machine operations include accessing the computer's data store, in order to write start-of balance values into each shadow credit and debit record.

Next, in step (c), in response to every transaction received from each stakeholder (*e.g.*, via a communications network), the supervisory institution computer performs a series of machine operations, as directed by its allocated process, that adjusts each respective party's shadow credit record or shadow debit record (with each of the adjustments being made in chronological order). The series of machine operations, when so performed, produce further changes of state in response to every transaction that results in an exchange obligation. A stakeholder is only permitted certain transactions (as determined by its computer controlled process), for purposes of adjusting its shadow credit record and shadow debit record (*i.e.* those which do not result in the value of the shadow debit record being made less than the value of the shadow credit record at any time).

Lastly, in step (d), at the end-of-day, the supervisory institution computer, as directed by its process, instructs exchange-institution computers to exchange credits or debits (*e.g.*, via a communications network). The exchange is made to the credit and debit records of the respective stakeholder parties, according to the adjustments specified in permitted transactions. The credits and debits are made irrevocable, with time invariant obligations placed on the exchange institutions.

It seems clear that the method steps of claim 33 require the performance of a number of database operations (*e.g.*, writing to and updating records in files, based on specific types of transactions). Among other changes, changes of state are caused in the shadow credit and debit records. Thus, carrying out the method steps of claim 33 requires a computer to perform actions upon physical things or objects, sufficient to conclude that the method has been applied, and is therefore patent eligible.

II.D Expect the unexpected

The trend, of increasing use of the principle of equivalency, is far from being the only kind of change to which the IEEE is adapting. In the most recent decades, there has been a fascinating trend towards convergence, among the previously-separate physical sciences. For example, fields as previously distinct as molecular biology and electrical engineering are experiencing ever increasing levels of interaction, with educational institutions responding by offering majors in this precise area. Such interactions are certain to produce many "unforeseen inventions," as the Court says in *Bilski*, for decades to come.

III. Software is pervasive. Computer-implemented inventions are too important to a 21st century economy to deny patent protection

The software industry has undergone (and continues to undergo) spectacular growth since the decisions of *In re Alappat* and *Lotus*, in the mid-

1990s. In early 1996, the PTO adopted and published its "Examination Guidelines for Computer-Related Inventions," 61 *Fed. Reg*. 7478, (February 28, 1996) on which applicants relied to obtain patent claims to protect their technology developments. Figure 1 and Table 1 in the Appendix depict the historical sharp rise of software-related patents in force following these developments. They show that as of the end of 2012, nearly 1 million such patents were in force, a substantial fraction of all 2.23 million utility patents in force at the end of that year (See Table 2). The fate of these patent assets and the vast investments made in reliance thereupon depend on this Court's decision in this case. Going forward, an analysis by the United States Government Accountability Office ("GAO"), shows that approximately 50% of issued patents in recent years are software-related patents. GAO, *Intellectual Property: Assessing Factors that Affect Patent Infringement Litigation Could Help Improve Patent Quality*; GAO-13-465, (August 2013).

Patents on computer-implemented inventions are crucial to investment in innovation, because the most important and innovative ideas are often the most risky. Patents reduce that risk, and thereby increase the incentive to invest. The provision of property rights for software-implemented inventions thereby helps ensure that capital flows to new good ideas.

Once initial investments have been made, and a learning curve is established, patents continue to be important for assuring further investment will also be protected. The processes of continuing the operation of a software-based company (*e.g.*, coding, testing, debugging, integrating with other software, seeking any regulatory approval, developing marketing and distribution channels) are far more expensive than just the initial invention (and its "seed capital"). Patents are essential to protecting that continued investment.

IV. The consequences of a failure to preserve the patent-eligibility of software-implemented solutions are numerous and harmful to our country

Our 21st century economy depends on software-implemented systems. The Court must protect the public's settled expectation that nearly 1 million patents on such systems, particularly those that protect large investments in system development, will remain valid.

A failure to preserve the patent-eligibility of software-implemented solutions could result in a number of unintended consequences. More specifically, holding method, system, and product inventions, similar to those described in the Alice patents in suit, to be patent-ineligible could cause more inventors and companies to maintain trade secrets, which could result in a reduction of knowledge sharing in the engineering and academic arenas, fewer collaborations and strategic alliances among inventors, suppression of free exchange of technological ideas, and a reduction in the amount of investment for innovation itself.

In addition, because developers will take all necessary steps to ensure that their vast research and developments remain protected to the extent possible, a failure to preserve the patent-eligibility of software-implemented solutions may prompt developers to develop ways to maintain or extend trade secrecy in such software-related solutions. Holding software implemented method, system, and product inventions to be patent-ineligible could cause new software protection mechanisms to prohibit unauthorized use, sale, or reverse engineering of such systems.

For example, in order to frustrate reverse engineering, developers may utilize modern techniques to incorporate software implemented solutions into field-programmable chips, even at the loss of design flexibility or system performance. Developers may incorporate reverse engineering blocking mechanisms into product design. Further, developers may even choose to eliminate distribution of software documentation in order to shield the nature of such inventions outside of their companies. More employees may be required to sign covenants not to compete. Thus, we could see a return to the economic landscape of marketing and sale of software-implemented systems in the 1960s and 1970s, in which the design and implementation details relating to software-implemented innovations were protected through secrecy agreements.

The failure to preserve the patent-eligibility of software implemented solutions could result in greater reliance on copyright protection and possibly cause more patent applications to be first filed in countries outside of the U.S. that offer greater protection of software implemented inventions (*e.g.* Australia, Japan, and others). Lastly, the failure to preserve patent-eligibility of software implemented solutions could result in companies transferring their software development operations outside the United States, resulting in a loss of jobs in the high-tech sector and a drain of U.S.-based knowledge out of the country.

IEEE-USA respectfully submits that failing to preserve the patent-eligibility of software implemented solutions, or even diminishing the scope of their patent-eligibility, will lessen our country's ability to fulfill the directives of the U.S. Constitution "[t]o promote the progress of science and useful arts."

CONCLUSION

IEEE-USA therefore urges this Court to rule on the question presented in the affirmative.

Respectfully submitted,

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APPENDIX

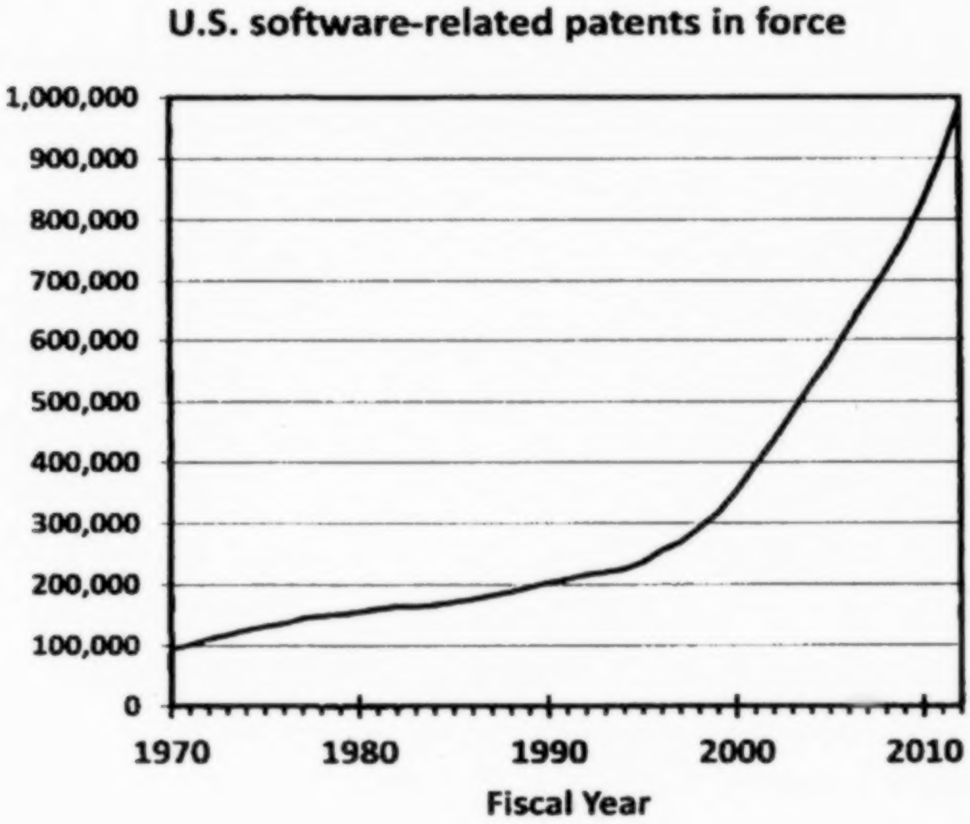

Figure 1

"Software-related" patents were identified using the definitions provided in PTO 2003 at 77 (footnote 7). This definition is based on the US patent classes and subclasses that were determined by PTO experts to contain patent applications or issued patents containing some element of either general purpose software or software that is specific to some form of hardware. This is the same definition used in the GAO 2003 report. Using these classes and subclasses, a search on FeePatentsOnline.com ("FPO Database") confined to appropriate date ranges produced the counts shown in the attached tables.

For comparison, the number of utility patents in force by the end of each fiscal year is also provided. The number of issued patents each year was obtained from the PTO's annual reports. Table 1 shows the results for software-related patents in force whereas Table 2 pertains to all utility patents in force.

The PTO's Technology Assessment and Forecast ("TAF") database was used to obtain general patent maintenance statistics in order to account for early expiration of patents before their nominal term. The 17-year patent term laws were changed in 1995 under the GATT legislation and 35 U.S.C. § 154(a)(2) provides that patents filed on or after June 8, 1995 have a term of 20 years from the priority application date. Under § 154(c)(1) the term of a patent that was in force on or that results from an application filed before June 8, 1995 is the greater of the 20-year term, or 17 years from grant. Because no patents expired yet under § 154(a)(2), the only two categories of patents analyzed separately are those having the 17-year term, shown as "Old Patents" in the tables, and those governed by § 154(c)(1), shown as "patents subject to GATT effects." Expirations from both categories were combined.

Patent term adjustments under 35 U.S.C. § 154(b) began taking effect only for patents issued after 2000 and as such, it is not manifested in patent expirations for patents issued to date. The number of patents extended due to the FDA approval process under 35 U.S.C. § 156 is negligible for the purposes of this analysis, as PTO data in 78 *Fed. Reg.* 31886 (May 28, 2013) shows that the terms of only about 70 such patents per year are extended.

The results obtained in this analysis for U.S. utility patents in force are within 1% of the limited results published by the World Intellectual Property Organization for the years 2004-2012. See "WIPO IP Statistics Data Center," Patents In Force Indicator, at http://www.wipo.int/ipstats/en/statistics/patents/.

Table 1

FY	PATENTS SUBJECT TO GATT EFFECTS				MAINTENANCE			OLD PATENTS		Software-related patents in force
	Application date > June-7-1975				Total expired in FY due to failure to renew	Fraction issued in FY that expired any time before nominal term	Total issued in FY that expired any time before nominal term	Issued < June-8-1978		
	Issued	Nominal term expired (long pendency)	Nominal term expired (mid pendency)	Nominal term expired (short pendency)				Issued	Nominal term expired	
t	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*	*m*
Source	FPO Database				Scaled from PTO TAF database			FPO Database*		Calculated **
1970								12,620	5,002	94,138
1971								11,123	4,548	100,713
1972								13,733	3,384	111,062
1973								12,081	4,933	118,211
1974								12,709	5,568	125,352
1975								11,875	5,714	131,512
1976								13,044	7,268	137,288
1977								15,343*	7,658	144,972
1978	11,636								6,790	149,819
1979	9,459								7,234	152,044
1980	10,436								7,383	155,097
1981	12,057						25		6,263	160,891
1982	11,917						1,596		8,401	164,407
1983	10,765						5,480		10,976	164,196
1984	13,206						8,126		10,879	166,524
1985	14,616				0	0.6390	9,340		9,948	171,192
1986	15,974				416	0.6286	9,902		10,986	175,764
1987	20,324				1,411	0.6205	12,682		12,620	182,056
1988	18,697				2,019	0.6068	11,418		11,123	187,611
1989	24,179				2,227	0.5893	14,191		13,733	195,831
1990	21,986				2,886	0.5905	13,156		12,081	202,829
1991	23,476				5,114	0.5827	14,607		12,709	208,482
1992	25,891				6,696	0.5725	14,524		11,875	215,799
1993	28,106				8,835	0.5593	14,846		13,044	220,028
1994	29,816				9,845	0.5478	16,394		15,343*	224,656
1995	31,873	391*			13,027	0.5338	16,930		7,484*	235,627
1996	33,806	1,035*	1,059*		12,460	0.5134	18,130			254,879
1997	36,020	1,569*	4,850*	2,703*	13,516	0.5181	18,607			268,161
1998	48,898	2,214	6,209	3,474*	12,832	0.5261	27,055			292,334
1999	50,336	2,344	7,018	2,658	14,088	0.5087	27,239			316,881
2000	59,438	2,797	7,204	2,824	13,522	0.4940	27,787			352,367
2001	62,692	4,102	8,145	2,369	13,828	0.3232	19,543			394,584
2002	61,885	4,962	7,048	1,824	17,177	0.3313	20,937			433,895
2003	69,023	4,167	6,066	2,058	18,634	0.3115	20,771			479,719
2004	73,500	4,544	6,957	3,588	20,107	0.2986	20,878			527,464
2005	68,188	3,430	8,862	4,850	20,755	0.1290	8,142			568,386
2006	79,827	4,302	7,891	6,918	23,368	0.1466	12,033			617,396
2007	79,946	3,285	9,590	7,376	22,615	0.1340	10,033			666,576
2008	80,348	3,495	8,543	10,287	23,172	0.1282	9,931			714,756
2009	85,351	4,251	9,510	10,137	25,529	0.0000				765,053
2010	106,902	4,264	10,699	10,471	34,550	0.0000				826,912
2011	115,020	4,994	10,817	10,940	32,844	0.0000				897,371
2012	132,244	5,167	12,788	11,025	32,818	0.0000				983,862

Notes:

* Except for 1995, where applications filed on or before June 7, 1995 are shown per search in FPO database

** Software-related patents in force at yeat t calculated as follows

For t < 1995: $m(t)=m(t-1)+a(t)+h(t)-e(t)-k(t)+g(t-17)$; For $t \geq 1995$:

$m(t)=m(t-1)+a(t)+h(t)-b(t)-c(t)-d(t)-e(t)-k(t)+[b(t)g(t-17)/a(t-17)+c(t)g(t-18)/a(t-18)+d(t)g(t-19)/a(t-19)]$

Last terms involving column g are corrections to avoid double counting of expirations included in column e

Table 2

FY	PATENTS SUBJECT TO GATT EFFECTS				MAINTENANCE			OLD PATENTS		Utility Patents in Force
	Application date > June-7-1975				Total expired in FY due to failure to renew	Fraction issued in FY that expired any time before nominal term	Total issued in FY that expired any time before nominal term	Issued < June-8-197		
	Issued	Nominal term expired in FY (long pendency)	Nominal term expired in FY (mid pendency)	Nominal term expired in FY (short pendency)				Issued	Nominal term expired	
t	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*	*m*
Source	Annual Report	FPO Database (Utility Patents)			Annual Report	PTO TAF database		Annual Report*		Calculated **
1970								66,334	41,739	856,119
1971								70,370	37,602	888,887
1972								83,215	28,643	943,459
1973								67,491	39,416	971,534
1974								79,262	43,574	1,007,222
1975								70,132	41,928	1,035,426
1976								75,311	50,174	1,060,563
1977								84,197*	48,458	1,096,302
1978	65,963								45,454	1,116,811
1979	51,686								49,277	1,119,220
1980	56,618								52,532	1,123,306
1981	66,617						136		42,538	1,147,385
1982	59,449						7,962		51,385	1,155,449
1983	54,744						27,869		65,237	1,144,956
1984	66,753						41,070		70,022	1,141,687
1985	69,667				1	0.632	44,025		61,596	1,149,757
1986	71,301				1,121	0.629	44,816		61,949	1,157,988
1987	82,141				6,172	0.621	50,972		66,334	1,167,623
1988	77,317				11,224	0.607	46,914		70,370	1,163,346
1989	95,831				12,416	0.589	56,473		83,215	1,163,546
1990	88,974				12,060	0.591	52,539		67,491	1,172,969
1991	91,822				19,134	0.593	54,420		79,262	1,166,395
1992	99,405				28,603	0.572	56,909		70,132	1,167,065
1993	98,675				38,475	0.559	54,074		75,311	1,149,954
1994	101,270				38,859	0.548	55,477		84,197*	1,128,168
1995	101,895	2,214*			48,604	0.534	54,396		42,425*	1,136,820
1996	104,900	5,658*	6,003*		60,392	0.513	53,860			1,169,667
1997	111,977	8,513*	27,047*	15,321*	54,495	0.518	58,016			1,176,278
1998	139,297	12,235	33,686	18,981*	41,063	0.526	73,284			1,209,635
1999	142,852	11,691	38,778	14,419	52,289	0.509	72,663			1,236,955
2000	164,486	14,222	35,938	15,604	47,958	0.494	81,264			1,299,804
2001	169,571	20,734	31,248	11,820	49,077	0.323	54,806			1,386,743
2002	160,839	23,651	35,620	9,274	53,724	0.331	53,288			1,466,896
2003	171,493	18,600	28,914	10,399	57,770	0.311	53,417			1,559,086
2004	169,295	18,366	31,052	17,102	63,552	0.299	50,546			1,640,011
2005	151,077	14,182	35,816	21,649	67,534	0.129	19,490			1,696,345
2006	162,509	17,051	32,633	27,959	72,654	0.147	23,829			1,755,756
2007	160,306	13,306	38,009	30,502	67,122	0.134	21,475			1,815,887
2008	154,699	13,668	34,606	40,771	67,127	0.129	19,991			1,866,976
2009	165,213	16,322	37,196	41,062	66,330	0.000				1,926,915
2010	207,915	15,791	41,079	40,956	79,993	0.000				2,013,634
2011	221,350	16,962	40,056	42,004	82,146	0.000				2,109,560
2012	246,464	16,520	43,430	40,828	80,050	0.000				2,230,643

Notes:

* Except for 1995, where applications filed on or before June 7, 1995 are shown per search in FPO database

** Utility patents in force at yeat *t* calculated as follows

For $t < 1995$: $m(t)=m(t-1)+a(t)+h(t)-e(t)-k(t)+g(t-17)$; For $t \geq 1995$:

$m(t)=m(t-1)+a(t)+h(t)-b(t)-c(t)-d(t)-e(t)-k(t)+[b(t)g(t-17)/a(t-17)+c(t)g(t-18)/a(t-18)+d(t)g(t-19)/a(t-19)]$

Last terms involving column *g* are corrections to avoid double counting of expirations included in column *e*

AMICUS
CURIAE
BRIEF

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No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF THE INTELLECTUAL PROPERTY LAW ASSOCIATION OF CHICAGO AS AMICUS CURIAE IN SUPPORT OF NEITHER PARTY

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INTEREST OF AMICUS CURIAE

The Intellectual Property Law Association of Chicago ("IPLAC") submits this brief as amicus curiae, but in support of neither party on the ultimate merits of the case.[1]

Founded in 1884, the Intellectual Property Law Association of Chicago is a voluntary bar association of over 1,000 members who practice in the areas of patents, trademarks, copyrights, trade secrets and the legal issues they present. IPLAC is the country's oldest bar association devoted exclusively to intellectual property matters. In litigation, IPLAC's members are split about equally between plaintiffs and defendants. Its members include attorneys in private and corporate practices before federal bars throughout the United States, as well as the U.S. Patent and Trademark Office and the U.S. Copyright Office. As part of its central objectives, IPLAC is dedicated to aiding in the development of intellectual property law, especially in the federal courts.[2]

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[1] Petitioner and respondents each have filed and lodged with the Clerk a letter of consent to the filing of amicus curiae briefs in support of either party or of neither party. Pursuant to Supreme Court Rule 37.6, this brief was not authored, in whole or in part, by counsel to a party, and no monetary contribution to the preparation or submission of this brief was made by any person or entity other than IPLAC or its counsel. After reasonable investigation, IPLAC believes that (a) no member of its Board or Amicus Committee who voted to prepare this brief, or any attorney in the law firm or corporation of such a member, represents a party to this litigation in this matter, (b) no representative of any party to this litigation participated in the authorship of this brief, and (c) no one other than IPLAC, or its members who authored this brief and their law firms or employers, made a monetary contribution to the preparation or submission of this brief.

SUMMARY OF ARGUMENT

Congress implemented a plan for providing and protecting rights of inventors and promoting the advance of the useful arts by broadly drafting the patent statute without technological exclusions in order to embrace yet unknown innovations. Thus, 35 U.S.C. § 101 places few limits on the types of inventions that are eligible for patent protection.

For more than a century, this Court has applied § 101 using a flexible and broad subject matter analysis. It is this elasticity of § 101 that has made the U.S. patent system one of the strongest in the world.

This Court now seeks to resolve whether a specific type of invention – a computer-implemented invention – is patent-eligible under § 101. The Court has stated repeatedly that § 101 is a filter of subject matter for patenting that does not include laws of nature, natural phenomena, and abstract ideas. *See, e.g., Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, ___ U.S. ___, 132 S.Ct. 1289 (2012). However, a concern has arisen that perhaps "no one understands what makes an idea 'abstract.'" *CLS Bank International v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341 at 1349 (Fed. Cir. 2012) (citing M. Lemley, et al., *Life after Bilski*, 63 Stan. L. Rev. 1315, 1316 (2011)).

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[2] While over 30 federal judges are honorary members of IPLAC, none of them was consulted or participated in any way regarding this brief.

As set forth in more detail below, IPLAC respectfully requests that the Court continue to apply its prior precedent regarding patent eligibility under 35 U.S.C. § 101 to computer-implemented inventions. According to the Court's precedent, exceptions to patent eligibility under § 101 must necessarily include laws of nature, natural phenomena and abstract ideas, including algorithms or mathematical formulas and fundamental scientific and business principles. This is the test this Court should continue to apply.

This Court should not disturb Congress and the Court's prior precedent stating the threshold for patent eligible subject matter, which has fostered innovation and public disclosure over a wide variety of useful arts—and importantly, in new and emerging fields of technology, including computer-implemented inventions. The judgment of this Court should be consistent with the Court's prior precedent that computer-implemented inventions are eligible for patenting if they cover specific implementations of an abstract idea and do not wholly preempt the abstract idea itself.

PROCEEDINGS BEFORE THE FEDERAL CIRCUIT

The original Federal Circuit opinion in this case, *CLS Bank Int'l v. Alice Corp.*, 685 F.3d 1341 (Fed. Cir. 2012), adopted a general test that a patent claim is not patentable under § 101 where ineligibility is "manifest", i.e., when "the single most reasonable understanding is that the claim is directed to nothing more than a fundamental truth or disembodied concept." 685 F.3d at 1352. However.

this Court's decisions are devoid of a "manifest exclusion test." This test should not be adopted.

The original Federal Circuit panel dissent, in contrast, adopted a test of "inventive concept" to apply in evaluating patent eligibility under § 101. *Id.*, 685 F.3d at 1356. Yet this alternate test is precisely the type of exclusion from patent eligibility that Congress, through its implementation of the patent statute sought to avoid. Moreover, this Court's precedent does not provide a focused test of inventiveness as to § 101. An "inventive concept" test will only reintroduce the difficult problem of evaluating "inventiveness." The absence of a uniform definition for "invention" is well known, expressed by this Court itself to be avoided (*see Graham v. John Deere & Co.*, 383 U.S. 1 (1966)), and specifically sought by Congress to be avoided by the adoption of 35 U.S.C. 103. *Id.* at 14-17.

Following its rehearing en banc, the Federal Circuit introduced conflicting tests for patent eligible subject matter under 35 U.S.C. § 101. While seven judges affirmed the district court's decision that none of the method and computer readable media claims at issue were patent eligible subject matter under § 101, there was no majority opinion to guide the lower courts in reviewing such patent claims in the future. Moreover, the en banc panel was evenly divided on the patent eligibility of the asserted system claims and thus affirmed the district court's holding that the system claims are not directed to patent eligible subject matter under § 101.

Judge Lourie's concurring opinion (joined by Judges Dyk, Prost, Reyna and Wallach) found all asserted method, computer readable media and system claims ineligible for patent protection. Judge Lourie emphasized the preemption test, which hinges on whether a claim covers an abstract idea that preempts all uses of the idea within the stated field. *See CLS Bank Int'l v. Alice Corp.*, 717 F.3d 1269, 1273-92 (Fed. Cir. 2013) (en banc). He explained that "[a]bstract methods do not become patent-eligible machines by being clothed in computer language." *Id.* at 1292.

By contrast, Chief Judge Rader (joined by Judges Linn, Moore and O'Malley) took a broader view of patent eligible subject matter and found the asserted system claims patent eligible:

> [I]t is important to remember that all patents 'pre-empt' some future innovation in the sense that they preclude others from commercializing the invention without the patentee's permission. Pre-emption is only a subject matter eligibility problem when a claim preempts all practical uses of an abstract idea.

Id. at 1300.

Judge Newman seemed to take the broadest view of patent eligibility under § 101 and found all asserted method, computer readable media and system claims to be patent eligible. Directly contradicting Judge Lourie's plurality opinion, Judge Newman rejected the focus on preemption, writing that "[t]here is no need for an all-purpose definition of 'abstractness' or 'preemption,' as heroically attempted today." *Id.* at 1322.

As set forth above, the Federal Circuit not only was unable to reach common ground, but also propounded conflicting standards for determining patent eligibility of computer-implemented inventions under § 101. It is of the utmost importance to have a consistent legal standard for evaluation of patent eligibility of computer-implemented inventions under § 101 to guide the U.S. Patent and Trademark Office and the courts.

ARGUMENT

I. PATENT CLAIMS SATISFY 35 U.S.C. § 101 WHEN THEY DO NOT PREEMPT THEIR UNDERLYING ABSTRACT IDEAS

A. This Court Has Fulfilled Congress' Intent In Construing § 101 Broadly and Flexibly

This Court's prior decisions are consistent with 35 U.S.C. § 101, which provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

This Court has interpreted the language of § 101 broadly: "In choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope." *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980). Through its broad language, § 101 readily accommodates the rapid pace of innovation and assimilation of new technologies, including technologies never anticipated at the time § 101 was enacted. As this Court has stated, patentable subject matter includes "anything under the sun that is made by man." *Id.* at 309 (quotations and citations omitted). This Court has not excluded particular technologies from § 101, no matter how unusual or bizarre. *See Diamond v. Diehr*, 450 U.S. 175, 182-83 (1981).

More recently, in *Bilski v. Kappos*, ___U.S. ___; 130 S. Ct. 3218 (2010), the Court considered the Federal Circuit's previous "machine or transformation" test for determining patent-eligible subject matter and "cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed." *Id.* at 3226 (quotations and citations omitted). Thus, this Court ruled that "[t]he machine-or-transformation test is not the sole test for deciding whether an invention is a patent-eligible 'process' [under § 101]." *Id.* at 3227.

Although in *Bilski*, this Court recognized that its precedents provide "three specific exceptions" to § 101's patent-eligibility principles, the Court emphasized that those exceptions do not give "the Judiciary *carte blanche* to impose other limitations that are inconsistent with the text and the statute's purpose and design." *Id.* at 3226.

Even more recently, in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, ___ U.S. ___; 132 S.Ct. 1289 (2012), this Court reiterated that too broad an interpretation of the exclusionary principle could eviscerate patent law. *Id.* at 1293. In doing so, the Court acknowledged that all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas. *Id.* In *Mayo*, the Court referenced its earlier opinion in *Diehr*, explaining that:

> [T]he Court pointed out that "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm." 450 U.S. at 187, 101 S.Ct. 1048 (quoting *Parker v. Flook*, 437 U.S. 584, 590, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978)). It added that "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Diehr, supra*, at 187, 101 S.Ct. 1048. And it emphasized Justice Stone's similar observation in *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 59 S.Ct. 427, 83 L.Ed. 506 (1939): "While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." 450 U.S. at 188, 101 S.Ct. 1048 (quoting *Mackay Radio, supra*, at 94, 59 S.Ct. 427).

Mayo at 1293-94.

The Court added, "Still as the Court has also made clear, to transform an unpatentable law of nature into a patent-eligible application of such a law, one must do more than simply state the law of nature while adding the words 'apply it.' *See, e.g., Benson, supra*, at 71-72, 93 S.Ct. 253." *Id.* at 1294.

This Court found in *Mayo* that the process claims at issue did not satisfy the conditions of § 101 because (a) the steps in the claimed processes (apart from the natural laws themselves) involved well-understood, routine, conventional activity previously engaged in by researchers in the field, and (b) at the same time, upholding the patents would risk disproportionately tying up the use of the underlying natural laws, inhibiting their use in the making of further discoveries. *Mayo* at 1294. This Court also stated:

> If a law of nature is not patentable, then neither is a process reciting a law of nature, unless that process has additional features that provide practical assurance that the process is more than a drafting effort designed to monopolize the law of nature itself. A patent, for example, could not simply recite a law of nature and then add the instruction "apply the law."

Id. at 1297.

The Court reiterated:

> [T]o consider the three steps [of the patent claims at issue] as an ordered combination adds nothing to the laws of nature that is not already present when the steps are considered separately. *See Diehr, supra*, at 188, 101 S.Ct. 1048 ("[A] new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made"). Anyone who wants to make use of these laws must first administer a thiopurine drug and measure the resulting metabolite concentrations, and so the combination amounts to nothing significantly more than an instruction to doctors to apply the applicable laws when treating their patients. . . .

> To put the matter more succinctly, the claims inform a relevant audience about certain laws of nature; any additional steps consist of well-understood, routine, conventional activity already engaged in by the scientific community; and those steps, *when viewed as a whole*, add nothing significant beyond the sum of their parts taken separately. For these reasons we believe that the steps are not sufficient to transform unpatentable natural correlations into patentable applications of those regularities.

Mayo at 1298 (emphasis added).

This case is an opportunity for this Court to affirm that it will follow the same precedents in applying the broad and flexible scope of § 101 to computer-implemented inventions.

B. Patent Claims To Computer-Implemented Inventions Recite Patent-Eligible Subject Matter When They Do Not Remove Their Underlying Abstract Ideas From The Public Domain

Consistent with the broad language of § 101, the Court has correctly created exceptions to patent eligibility for laws of nature, natural phenomena, and abstract ideas. However, these exceptions do not limit the *subject matter* of the four specified categories of § 101. Instead, they provide guidance to the decision-maker in evaluating the eligibility of the claimed subject matter.

The exceptions that exist to § 101 patent eligibility — laws of nature, natural phenomena, and abstract ideas — are a matter of common sense: An inventor is not entitled to claim one of these basic principles in isolation, because to do so would remove it from the public domain. *See, e.g., Diehr*, 450 U.S. at 185. These are the "basic tools of scientific and technological work," *Gottschalk v. Benson*, 409 U.S. 63, 67-68 (1972), "free to all men and reserved exclusively to none." *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

For example, this Court has refused to permit a patent claim where it would "wholly pre-empt" the use of a mathematical formula. *Benson*, 409 U.S. at 71-72. ". . . [A]n algorithm, or mathematical formula, "is like a law of nature, which cannot be the subject of a patent." *Diehr*, 450 U.S. at 186. However, the Court in *Diehr* also stated, "It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* at 187 (emphasis in original; citations omitted); *see also O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 119 (1854) (provided application contains sufficient detail, "[w]hoever discovers that a certain useful result will be produced in any art, machine, manufacture, or composition of matter by the use of certain means is entitled to a patent for it"). Thus, "it is equally clear that a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm." *Parker v. Flook*, 437 U.S. 584, 590 (1978).

In *Diehr*, this Court held that a claim that incorporated a mathematical equation constituted patentable subject matter because the claim, *as a whole*, defined a rubber molding process and not just an equation. 450 U.S. at 192–93. In doing so, the Court distinguished two of its earlier decisions:

Parker v. Flook and *Gottschalk v. Benson.* Distinguishing *Flook* as merely reciting a mathematical formula, the Court stated: "In contrast [to *Flook*], the respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber." *Diehr*, 450 U.S. at 187. "Even though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented." *Flook*, 437 U.S. at 594.

Similarly, the claims in *Benson* were directed to a method of programming a computer to convert signals from binary coded decimal form into pure binary form. The Court rejected the claims because they were not limited in scope; indeed, "the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm *itself*." *Benson*, 409 U.S. at 71-72 (emphasis added).

The mathematical formula at issue in *Diehr* was well known, as were the process steps of installing rubber in a press, closing the mold, and determining the temperature of the mold. Additional steps included "constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time." *Diehr*, 450 U.S. at 187. While the Court noted that "insignificant post-solution activity will not transform an unpatentable principle into a patentable process," *id.* at 191-92, that was not the case in *Diehr*:

> On the other hand, when a claim containing a mathematical formula implements or applies

> that formula in a structure or process which, *when considered as a whole*, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of §101.

Id. at 192; (emphasis added).

What separates a law of nature, natural phenomenon or abstract idea, including an algorithm or mathematical formula or scientific or business principle, from patent-eligible subject matter is the *application* of the law, phenomenon or idea to "a new and useful end." *Diehr*, 450 U.S. at 188 n.11 (citations omitted); (emphasis added); *see also Mackay Radio & Tel. Co. v. Radio Corp.*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.")

C. Congress And The Court's Precedent Do Not Permit Wholly New § 101 Tests For Different Types Of Claims

Allowing for various tests in a § 101 analysis would eventually result in a rule that would allow for patenting of abstract ideas. *See Mayo* at 1298. It would allow non-eligible subject matter to be patented. Indeed, a test that would allow for patentability in the absence of "manifest" evidence otherwise, may allow for the patenting of abstract ideas and laws of nature in cases where the wording of the claims is sufficiently ambiguous to mask their true implication. It would allow the issuance and enforcement of claims which fail "the single most reasonable understanding" test, but that on balance are directed to "nothing more than a fundamental truth or disembodied concept."

It is true that in *Bilski*, the Court specifically stated it was not "foreclos[ing] the Federal Circuit's development of other [than machine-or-transformation] limiting criteria [for § 101 claim eligibility] that further the purposes of the Patent Act . . ." *Bilski* at 3231. However, the Court cautioned that the Federal Circuit may only develop criteria "not inconsistent with [the Patent Act's] text." *Id.* The "manifestly evident" test is inconsistent with the Patent Act's text. The test would indeed disallow the detailed analysis of the claim language as a whole as evident in *Mayo*.

The bar to patent eligibility set by the "wholly preempted" rule in *Diehr* is low. Raising the bar further would be at odds with § 101 and this Court's precedent. Claims to computer-implemented inventions fall within the scope of eligible subject matter under § 101 when they do not claim laws of nature, natural phenomena and abstract ideas (including algorithms or mathematical formulas and scientific or business principles) or nothing more than "apply [one of] these" to § 101 eligible subject matter. In other words, patent claims run afoul of § 101 and this Court's precedent when they remove laws of nature, natural phenomena and abstract ideas (including algorithms or mathematical formulas and scientific or business principles), or the application of any of them, from the public domain.

II. CONGRESS AND THIS COURT'S PRECEDENT DO NOT INTEND § 101 PATENT ELIGIBILITY TO BE JUDGED BY "INVENTIVE CONCEPT"

Requiring a sole focus on the presence or absence of an "inventive concept" would lead to an improper reintroduction of the discredited "invention" test for patents. That reintroduction would wreak havoc on the patent system.

Section 101 has an interplay with other statutory sections such that courts need not solely focus on inventiveness under § 101. After all, § 101 ends with the caveat that even though a claim may be said to contain patent eligible subject matter, it still must satisfy the other requirements of 35 U.S.C. §§ 102, 103, and 112. "The understanding that these three requirements are *separate and distinct* is long standing and has been universally accepted." *In re Bergy*, 596 F.2d 952, 960 (CCPA 1979) (emphasis in original), *vacated & affirmed by Diamond v. Chakrabarty*, 447 U.S. 303 (1980). Indeed, Judge Rich correctly described them as doors that require separate keys. *Id.* at 960-62.

In other words, simply because an invention contains patent eligible subject matter does not mean that a patent should issue. "The 'novelty' of any element or step in a process, or even of the process itself" is a separate question to be considered under § 102 and "is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of patentable subject matter under § 102." *Diehr*, 450 U.S. at 188-89. Section "101 was never intended to be a 'standard of patentability'; the standards, or conditions as the statute calls them, are in § 102 and § 103 [and § 112]." *Bergy*, 596 F.2d at 963; *see also Diehr*, 450 U.S. at 189 (reinforcing that while § 101 is a "general statement of the type of subject matter that is eligible for patent protection," § 102 "covers in detail the conditions relating to novelty.") (Citations omitted). The legislative history of § 101 is consistent. "Section 101 sets forth the subject matter that can be patented, 'subject to the conditions and requirements of this title.' The conditions under which a patent may be obtained follow, and § 102 covers the conditions relating to novelty." S. Rep. No. 82-1979, 82d Cong., 2d Sess., at 5 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2399.

Once § 101 is satisfied, the inventor still must satisfy §§ 102, 103 and 112 before he will be entitled to a patent. *See Bergy*, 596 F.2d at 960-62 (discussing separate doors for §§ 102 and 103). The object and purpose of § 103 is to promote "really novel advances in the art, rather than those attributable merely to a person having ordinary skill in the trade." *Vincent v. Suni-Citrus Prods. Co.*, 215 F.2d 305, 315 (5th Cir. 1954). The test of nonobviousness is independent of §§ 102 and 112 tests of novelty, enablement and definiteness, and patentability depends upon satisfaction of all of these requirements. *See, e.g., Nat'l Dairy Prods. Corp. v. Borden Co.*, 261 F. Supp. 771 (E.D. Wis. 1966); *see also Eimco Corp. v. Peterson Filters & Eng'g Co.*, 406 F.2d 431 (10th Cir. 1968); *Bros. Inc. v. Browning Mfg. Co.*, 317 F.2d 413 (8th Cir. 1963).

The profound truth underlying Congress' broad statement of eligibility is that it fosters innovation. Indeed, the foundation of our patent system is the notion that the lure of a United States patent encourages creativity.[3] Filing an application provides the applicant's quid pro quo—disclosure and ultimate publication—to the benefit of the public. Even if those applications do not issue as patents, the public benefits because of their dedication. A cramped reading of § 101 would discourage filings, and it would be impossible to gauge what the public lost as a result.

It is true that *Mayo*, *Diehr* and *Flook* reference "inventive concept" as a matter for § 101 consideration. *Mayo* at 1304. But *Bilski*, *Benson* and *Morse* do not reference "inventive concept." Moreover, *Diehr* describes the holding in *Flook* as standing "for no more than [] long established principles [against patenting of laws of nature, natural phenomena, and abstract ideas]." *Diehr* at 185.

While it is true the Court has used the term "inventive concept," and acknowledged the potential for overlap with §§ 102, 103 and 112 (*Mayo* at 1304), the Court has never stated that an "inventive concept" is *per se* or *always* needed in a § 101 analysis. Instead, the Court has stated that the portions of a claim that recite a law of nature or abstract idea must be accompanied by other elements sufficient to ensure that the patent claim as a whole amounts to significantly more than a recitation of an application of a natural law or abstract idea. *Mayo* at 1294.

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[3] *See, e.g., The Supreme Court Engages in Judicial Activism in Interpreting the Patent Law in eBay, Inc. v. MercExchange, L.L.C.*, 10 Tul. J. Tech. & Intell. Prop. 165, 199-200 (2007) (a strong patent system provides incentives for enterprises and capital to smaller enterprises; however, a weaker patent system allows existing dominant enterprises to avoid additional competition, and by reducing the economic value of patents, increases incentives for the dominant enterprises to infringe).

A test of inventive concept akin to an evaluation of nonobviousness must certainly not be adopted. Such a test does not follow the totality of this Court's precedent on §§ 101 and 103, and will only reintroduce into § 101 doctrine immense confusion regarding the definition of the word "invention." That lack of definition is well known to the courts, expressed at length by the Court itself as to be avoided. *Graham v. John Deere & Co.*, 383 U.S. 1 (1966). Indeed, avoiding the very idea of testing inventions for an "inventive concept" was the underlying purpose of Congress' adoption of 35 U.S.C. 103. *Id.* at 14-17. This Court cannot have intended to introduce the amorphous concept of "invention" back into patent law as the sole test under § 101 following an eradication of this very test. *Id.*

Indeed, in *Bilski*, this Court confirmed the liberal application of § 101. The Court specifically cautioned "that courts should not read into the patent laws limitations and conditions which the legislature has not expressed." *Id.* at 3226. "Congress plainly contemplated that the patent laws would be given wide scope," and "took [a] permissive approach to patent *eligibility* to ensure that ingenuity should receive a liberal encouragement." *Id.* at 3225 (quotations omitted; emphasis added). Thus, this Court should not apply "inventive concept" as the test for patent eligibility under § 101.

III. SECTION 101 ELIGIBILITY IS SIMPLE – ALBEIT UNSATISFYING TO THOSE WHO DESIRE A BRIGHT LINE TEST

A. *Mayo* Is Instructive But Not Directly On Point

In her original dissenting opinion, Judge Prost correctly noted that the Federal Circuit did not write on a blank slate and cited to this Court's precedent regarding subject matter eligibility. *CLS Bank International v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341, 1356 (Fed. Cir. 2012). However, the present case involves claims directed to computer-implemented inventions that are more closely related to applications of an abstract idea, algorithm or mathematical formula, or scientific or business principle, rather than a law of nature. As such, this Court's analyses in law of nature cases, such as *Mayo*, while instructive, are not directly on point.

In *Bilski*, a case involving claims to a "fundamental economic practice" and "mathematical formula" found to be "an unpatentable abstract idea," the Court stated:

> In light of these precedents, it is clear that petitioners' application is not a patentable "process." Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk: "Hedging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class." 545 F.3d, at 1013 (Rader, J., dissenting); *** [other citations omitted]. The concept of hedging, described in claim 1 and reduced to a mathematical formula in claim 4, is an

> unpatentable abstract idea, just like the algorithms at issue in *Benson* and *Flook*. Allowing petitioners to patent risk hedging would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.

Bilski, ___ U.S. ___; 130 S.Ct. 3231.

Consistent with the above analysis, the Court should continue to focus its analysis under § 101 on whether the patent claims in question would effectively monopolize the underlying abstract idea and its application.

Most importantly, a court must consider the claim as a whole. A court must not strip the claim of important details that might not be essential to *understanding* the abstract idea underlying the invention, and then consider the remaining claim limitations in a vacuum. Where those details show that the claim does not patent the underlying abstract idea and remove the use of the abstract idea from the public domain, the claim should pass muster under § 101.

B. Applying § 101 Means Asking Two Questions

Applying the Court's *Diehr* tests to computer-implemented inventions, a first inquiry asks: do the claims include an abstract idea, algorithm or mathematical formula, or scientific or business principle? If so, the second inquiry is as follows:

- Are the claims drawn to subject matter otherwise patent eligible? If so, such claims are not rendered patent ineligible simply because they *use* an abstract idea, algorithm or mathematical formula, or scientific or business principle (*Diehr* at 187).

- Do the claims apply an abstract idea, algorithm or mathematical formula, or scientific or business principle in a structure or process which, when considered *as a whole*, is performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing)? If so, the claims are patent eligible (*id.* at 192).
- Do the claims apply the laws of nature to a new and useful end? If so, they are patent eligible (*id.* at 188 n.11).

Applying the *Mayo* test to computer-implemented inventions, the second inquiry asks: does the claim have additional features that provide practical assurance that the claim is more than a drafting effort designed to monopolize an abstract idea, algorithm, mathematical formula, scientific or business principle, itself? *Mayo* at 1297. Put another way, does the claim do more than instruct the relevant audience to apply the applicable idea, algorithm, formula, or principle in a specific situation? *Mayo* at 1298. Put more succinctly, do the claims do more than inform a relevant audience about an abstract idea, algorithm, mathematical formula, or scientific or business principle, by having additional steps that add something significant beyond the idea, algorithm, formula, or principle, and beyond well-understood, routine, conventional activity of a type necessary to apply the idea, algorithm, formula, or principle? *Mayo* at 1298. Essentially, do the claims do more than state an idea, algorithm, formula, or principle and add "apply it"' [or "apply it using a computer."] *Mayo* at 1294.

Claim limitations which tell the relevant audience about a natural law [abstract idea, algorithm, mathematical formula, or scientific or business principle] do not render claims patent eligible. *Id.* The same is true for limitations which suggest that a relevant person should take a law [abstract idea, algorithm, mathematical formula, or scientific or business principle] into account. *Id.* Similarly, process steps that instruct relevant individuals to engage in well-understood, routine, conventional activity do not confer patent eligibility. *Id.* at 1297-8. The same is true for steps in combination that amount to nothing more than instruction to apply applicable laws [abstract idea, algorithm, mathematical formula, or scientific or business principle]. *Id.* at 1298. Steps that tell relevant persons to gather data from which they may draw an inference in light of correlations are no better. *Id.* In sum, steps *that must be taken* in order to apply a natural law, abstract idea, algorithm, mathematical formula, or scientific or business principle merely instruct individuals to apply such concepts, and thus do not make claims patent eligible. *Id.*at 1299 (emphasis added).

Harmonizing this Court's prior decisions, the test of § 101 is simple. A claim to a computer-implemented invention, when taken as a whole, that simply states a law of nature, natural phenomena or abstract idea, including an algorithm or mathematical formula or a scientific or business principle, and removes any of these from the public domain may not be patented. Similarly, a claim that does nothing more than state a law of nature, natural phenomena or abstract idea, including an algorithm or mathematical formula or a scientific or business principle, and then adds "apply it" [including "apply it using a computer"] may not be patented.

C. Although Simple In Exposition And Difficult In Practice, The Simple Test Is Nevertheless The Correct Test

Applying the two-question test of the Court's prior decisions to claims directed to computer-implemented inventions is no doubt difficult and will necessitate careful review by the PTO and the Courts on a case-by-case basis, and will involve evaluating each patent claim as a whole.

Since all computer-implemented inventions at some level embody, use, reflect, rest upon, or apply abstract ideas, mathematical formulas, algorithms, or fundamental scientific or business principles, all claims to computer-implemented inventions may require application of the two-question test. The simple two-question test, however, must nevertheless be the test under § 101. The rule of law through Congress and this Court's precedent does not allow otherwise.

CONCLUSION

For the foregoing reasons, IPLAC respectfully requests that the Court continue to apply its prior precedent regarding exceptions to patent eligible subject matter under 35 U.S.C. § 101 to computer-implemented inventions.

Respectfully submitted,

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AMICUS
CURIAE
BRIEF

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED SATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICUS CURIAE* INTELLECTUAL PROPERTY OWNERS ASSOCIATION IN SUPPORT OF NEITHER PARTY

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STATEMENT OF INTEREST OF *AMICUS CURIAE*

The Intellectual Property Owners Association (IPO) is a trade association representing companies and individuals in all industries and fields of technology who own or are interested in intellectual property rights.[1] IPO's membership includes more than 200 companies and over 12,000 individuals who are involved in the association either through their companies or as inventor, author, executive, law firm, or attorney members. Founded in 1972, IPO represents the interests of all owners of intellectual property. IPO regularly represents the interests of its members before Congress and the USPTO and has filed amicus curiae briefs in this Court and other courts on significant issues of intellectual property law. This brief was approved by the IPO Board of Directors. A list of IPO board members can be found in the Appendix.[2]

INTRODUCTION

This case raises fundamental issues concerning the patent eligibility of computer-implemented inventions under Section 101 of the Patent Act. The issue before the Court in this case is:

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[1] No counsel for a party authored this brief in whole or in part, and no such counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than the *amicus curiae* or its counsel made a monetary contribution to its preparation or submission. Both parties consented to the filing of amicus briefs through blanket consent letters filed on December 11, 2013.

[2] IPO procedures require approval of positions in briefs by a two-thirds majority of directors present and voting.

> Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

Without taking any position on the particular facts of this case, IPO welcomes the opportunity to respond to this question. In doing so, IPO is not advocating any particular result with respect to the dispute in this case. However, IPO will endeavor to synthesize the holdings of this Court in a series of cases dating back to the Nineteenth Century and culminating in the recent decision in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012), to derive a set of principles and rules that will enable patent practitioners, the U.S. Patent and Trademark Office and the courts to consistently and predictably determine the patent eligibility of computer-implemented inventions.

SUMMARY OF ARGUMENT

The issue of patent eligibility of computer-implemented inventions is crucially important to IPO members and the broader U.S. economy. Nearly every sector of today's economy depends on innovations in computer-implemented technologies to improve products and services, increase productivity and efficiency, and strengthen competitiveness. As courts assess the patentability of computer-implemented inventions they should take care not to erect barriers to the patentability of new and useful technological advances that would threaten these benefits. Nor should courts impose a higher standard of patentability for computer-implemented inventions than is routinely applied to innovations in other fields of technology.

In recent years, both this Court and lower courts have issued a number of rulings which seek to draw the line between patent ineligible abstract ideas and patent eligible implementations of such ideas. In attempting to provide further clarity, this Court should take care not to apply overly formalistic rules or tests whose application to computer-implemented inventions might exclude significant new and useful inventions from patentability or encourage innovation in claim drafting rather than technology. IPO urges this Court to recognize several fundamental and longstanding principles that the U.S. Patent and Trademark Office and the courts can apply in determining whether a computer-implemented invention is patentable. In so doing, the Court should recognize that all inventions, to some extent, rely on the basic laws of nature and abstract ideas, and that any invention that applies such laws and ideas to achieve a new and useful end is potentially eligible for patent protection. *See, e.g., Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

In the context of computer-implemented inventions, as the question presented indicates, it is often possible to claim what is essentially the same invention as a computer-implemented "method," a "system," or a "storage medium" containing data and/or computer instructions. Generally, with respect to patent eligibility, it should not matter in such inventions which of those claim forms have been chosen by the patent drafter, as selecting one form would inappropriately elevate form over substance. However, it is also true that, in many instances, the use of a particular claim form can be significant in defining the nature or scope of the invention. Thus, the fact that the same subject matter can sometimes be claimed using different claim forms does not justify ignoring explicit claim limitations when conducting a Section 101 analysis. Rather, the claim as a whole, and all limitations, should be assessed. *See Diamond v. Diehr*, 450 U.S. 175, 188 (1981).

Applying these principles to computer-implemented innovations, the existing precedent suggests two fundamental considerations that the courts should apply in determining whether a particular computer-implemented claim is directed to a new and useful application of an idea as opposed to the idea itself: (1) the computer implementation must be claimed with sufficient particularity and specificity to ensure that meaningful limits on the scope of the claims are imposed; and (2) the computer implementation and corresponding claim elements must be a significant contributor to achieving the intended result and do more than simply describe the normal, conventional method to apply the idea.

ARGUMENT

I. COMPUTER-IMPLEMENTED INVENTIONS, PROPERLY CLAIMED, ARE PATENT-ELIGIBLE SUBJECT MATTER UNDER THIS COURT'S PRECEDENT DATING BACK TO THE NINETEENTH CENTURY

The Constitution empowers Congress to "promote the Progress of Science and the Useful Arts...." U.S. Const. Art. 1, § 8. Congress has implemented this grant in Section 101 of the Patent Statute by identifying certain subject matter, the invention or discovery of which may merit a patent: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title." 35 U.S.C. § 101. The terms employed in Section 101 have been used for over 200 years – since the beginning of the American patent system – to define the scope of patent eligible subject matter. Section 101's description of patent eligible subject matter is broad, intended by Congress to "include anything under the sun that is made by man." S. Rep. No. 82-1979 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2394, 2399. But it is also unquestionably not without boundaries. Most fundamentally, patent eligible subject matter cannot include "laws of nature, physical phenomena, and abstract ideas." As early as *Le Roy v. Tatham*, 55 U.S. 156 (1852), this Court explained that "[a] principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Id.* at 175. Since then, the principle that abstract ideas are unpatentable has repeatedly been confirmed.

Although the principle is longstanding, its application to specific patent claims has been challenging. As the multitude of opinions in this case below by the Court of Appeals for the Federal Circuit clearly indicates, let alone the numerous other lower court decisions struggling with Section 101, there has been a complete failure to bring any measure of consistency and predictability to the abstract idea inquiry. *See* Donald S. Chisum, *Weeds and Seeds in the Supreme Court's Business Method Patents Decision:*

New Directions for Regulating Patent Scope, 15 Lewis & Clark L. Rev. 11, 14 (2011) ("[The] Section 101 abstract idea preemption inquiry can lead to subjectively-derived, arbitrary and unpredictable results. This uncertainty does substantial harm to the effective operation of the patent system.").

A. A Practical and Useful Application of an Abstract Idea or Law of Nature is Patentable

As discussed below, there are a number of analytic tools, each derived from case law, which courts should look to in assessing patent eligibility. Key among these is the distinction between the underlying idea and a particular method or device for implementing it to accomplish a useful result. For example, in *Tilghman v. Proctor*, decided in 1880, this Court articulated the dividing line between eligible and ineligible subject matter as follows:

> [The] claim of the patent is not for a mere principle. The chemical principle or scientific fact upon which it is founded . . . was not discovered by Tilghman. He only claims to have invented *a particular mode* of bringing about the desired chemical union between the fatty elements and water.

102 U.S. 707, 729 (1880) (emphasis added). The Court drew the same distinction in its 1939 decision in *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, noting:

> While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.

306 U.S. 86, 94 (1939). And again in *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, the Court decided in 1948:

> He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from *the application of the law of nature to a new and useful end.*

333 U.S. 127, 130 (emphasis added).

In fact, this distinction is so well established in the precedents that this Court has stated that "[i]t is now commonplace that an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Diehr*, 450 U.S. at 187 (citations omitted).

This same dichotomy was addressed again by this Court in its recent decision on patent eligibility, in which the Court distinguished between ineligible claims to a law of nature itself and patent eligible processes that *apply* natural laws. As explained by the Court:

> The question before us is whether the claims do significantly more than simply describe [the law of nature]. To put the matter more precisely, do the patent claims add *enough* to their statements of the [law of nature] to allow the processes they describe to qualify as patent eligible processes that *apply* natural laws?

Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1297 (2012) (emphasis in original).

B. The Same Principles Should be Applied to Computer-Implemented Inventions as Apply to Other Inventions Implemented by Machines

When one recognizes that a computer is nothing but a machine that is capable of being configured, either through hardware or software, to perform a wide variety of tasks, it becomes clear that the fundamental issues presented in this case are not significantly different from those arising in some of the earliest cases relating to the use of machines to perform tasks more efficiently than they could be performed by humans. In fact, as early as 1864, the Supreme Court upheld Samuel Morse's claim for a "system of signs, consisting of dots and spaces, and of dots, spaces and horizontal lines" for manipulating a telegraph key in such a way as to produce a useful communication between two parties. *See O'Reilly v. Morse*, 56 U.S. 62, 86 (1853). As an example of one of the earliest electronic communication protocols, Morse's valid claim is not substantively different from many of the software implemented processes claimed by computer innovators in the Information Age.

These early cases also make it clear that a patent claiming the use of a machine to perform a new and useful task does not necessarily require that the machine itself be novel or specifically designed for that purpose. *See Cochrane v. Deener*, 94 U.S. 780, 788 (1876) ("The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result."). Indeed, section 100(b) of the Patent Act specifically defines the term patentable "process" to include "a *new use of a known* process, machine, manufacture, composition of matter, or material." 35 U.S.C § 100(b) (emphasis added).

Nothing in Section 101 suggests that an otherwise eligible "process, machine, manufacture, or composition of matter, or any new and useful improvement thereof" somehow becomes patent-ineligible simply because its implementation requires the use of a computer. A clear illustration of this principle is provided by *Diamond v. Diehr*. In *Diehr*, a previously unknown method for "molding raw, uncured synthetic rubber into cured precision products" that included a computer program was patentable because the industrial process underlying the invention was otherwise patentable. 450 U.S. at 177. As the Court held, "a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a . . . computer program, or digital computer." *Id.* at 187.

II. PATENT CLAIMS MUST BE CONSIDERED AS A WHOLE

Despite the ongoing challenges with Section 101, it is clear that "a process is not ineligible simply because it contains a law of nature or a mathematical algorithm." *Diehr*, 450 U.S. at 187 (internal quotation marks omitted). Instead, this Court has repeatedly indicated that an evaluation of the patentability of a computer-implemented claim must focus on the substance of the claim as a whole. As the Court stated in *Diehr*:

> It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.

Diehr, 450 U.S. at 188; *see also Bilski v. Kappos,* 130 S. Ct. 3218, 3230 (2010); *Prometheus*, 132 S. Ct. at 1303-04.

It is not uncommon for persons drafting claims for computer-implemented inventions to define the invention in terms of the method steps performed by the computer, the system that implements those steps or the media on which the instructions and data necessary to implement the steps are stored. In such cases, there is no sound basis for treating these equivalent claims differently in assessing eligibility and to do so would inappropriately elevate form over substance. Interpretations of Section 101 that "depend simply on the draftsman's art" are unworkable and do not effectuate the goal of sorting out inventions in computing or other fields from abstract ideas that merely invoke computer terminology in an incidental manner. *See Parker v. Flook*, 437 U.S. 584, 593 (1978).

This does not mean, however, that differences in claim language and claiming practice will always be irrelevant or inconsequential when determining the scope of the claimed subject matter. It is entirely probable that each of those aspects of a computerized process: the steps performed, the physical configuration of the system and the nature and location of the storage media, may have a separate and independent significance to the claimed implementation and it would be wholly improper to ignore them. In assessing patent eligibility, as in other forms of validity, one must consider not only those elements that are "novel" or "inventive," but whether all of the elements combined constitute a patentable invention.

Accordingly, while the claim form is not dispositive in determining eligibility, this does not relieve courts of their obligation to carefully construe claim language or to consider the claim as a whole in determining whether it is directed to statutory subject matter. In particular, courts should take into account all limitations included by the applicant and should avoid basing the determination of eligibility on a dissection of claim elements or on the court's subjective view of the "essence" or "heart" of the invention. Ultimately, it is the language of the claims alone that defines the invention. *See Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 419 (1908) ("the claims measure the invention"); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 345 (1961) ("There is no legally recognizable or protected 'essential' element, 'gist' or 'heart' of the invention in a combination patent.").

In sum, claims that are in fact directed to the same subject matter, regardless of claim form, should generally be treated the same in assessing patent eligibility under

Section 101. But courts must be careful to consider the entire claim and may not ignore substantive differences between claims when analyzing the claimed subject matter for purposes of the eligibility analysis.

III. A CLAIM FOR A COMPUTER-IMPLEMENTED INVENTION INVOLVING AN ABSTRACT IDEA IS PATENT ELIGIBLE IF IT DESCRIBES A SPECIFIC, PRACTICAL APPLICATION OF THE IDEA

Although there is seemingly little controversy as to the patentability of advances in computer technology itself, the use of computers to implement ideas that would otherwise be deemed patent ineligible abstract ideas raises an additional issue: what is required to convert a claim from one that merely states an abstract idea to one that provides a new and useful application of that idea? As the Court stated in *Prometheus*, "to transform an unpatentable law of nature into a patent eligible application of such a law, one must do more than simply state the law of nature while adding the words 'apply it.'" *Prometheus*, 132 S. Ct. at 1294. However, the cases also make it clear that a computer-implemented invention will not be deemed a mere abstract idea if the computer implementation is claimed with sufficient particularity and specificity to ensure that meaningful limits on the scope of the claims are imposed.

The need for specificity can be traced to the Court's seminal and oft quoted decision in *O'Reilly v. Morse*, in which the Court held ineligible Morse's claim to the use of "electro magnetism, however developed for marking or printing intelligible characters, signs, or letters, at any distances," and stating further:

> If this claim can be maintained, it matters not by what process or machinery the result is accomplished. For aught that we now know, some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current, without using any part of the process or combination set forth in the plaintiff's specification. His invention may be less complicated — less liable to get out of order — less expensive in construction, and in its operation. But yet, if it is covered by this patent, the inventor could not use it, nor the public have the benefit of it, without the permission of this patentee.

56 U.S. 62, 112; *see also Prometheus*, 132 S. Ct. at 1294 ("[U]pholding the patents would risk disproportionately tying up the use of the underlying [abstract ideas or] natural laws, inhibiting their use in the making of further discoveries."); *Bilski*, 130 S. Ct. at 3231 ("Allowing petitioners to patent risk hedging would preempt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.").

In its recent decision in *Prometheus*, this Court also made it clear that, in order to be effective in distinguishing a practical implementation from an abstract idea, the additional limitations must also be significant, and not merely "a drafting effort" that adds nothing of substance to the abstract idea itself. Thus, in that case, the Court held that claim limitations describing standard testing procedures that were so conventional and ordinary, both by themselves and in combination, that they contributed nothing of significance to the invention, were insufficient to render the claims eligible for a patent.

> These instructions add nothing specific to the laws of nature other than what is well-understood, routine, conventional activity, previously engaged in by those in the field. And since they are steps that must be taken in order to apply the laws in question, the effect is simply to tell doctors to apply the law somehow when treating their patients.

Prometheus, 132 S. Ct. at 1299-1300.[3]

In the context of evaluating patent eligibility, attention is often placed on a so-called "preemption analysis," including the Federal Circuit's plurality opinion in the case below. *See CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1280-83 (Fed. Cir. 2013) (Lourie, J). While a preemption analysis can be a consideration in determining patent eligibility, it should not be the primary focus, since over-reliance on such analysis can lead to the type of piecemeal, subjective interpretation of patent claims that this Court has recognized as improper. As noted above, in analyzing whether computer-related limitations render otherwise abstract claims patent eligible, courts should take care to read the claim in its entirety. *Any* computer-related limitation can be distilled into a series of seemingly "old" or "conventional" steps, such as performance of arithmetic calculations, storing data, transmitting data, etc. Piecemeal interpretation of claims is improper because it can trivialize any computer implementation of an abstract idea, no matter how detailed or specific the implementation. Even if its individual components may seem ordinary, the combination, sequence and details of a computer based implementation of an idea may nevertheless be sufficiently significant to render it patent eligible. *See Diehr*, 450 U.S. at 188.

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[3] Importantly, this Court's decision to disregard "conventional" techniques is fundamentally different from the application of Sections 102 and 103 of the Patent Act to reject claims that have been previously disclosed or obvious from all of the prior art that was in existence at the time of the filing. Rather, the examples provided by the Court suggest that these limitations are insufficient because they constitute either a necessary step in *any* application of the law of nature or are so ordinary and well-known as to amount to only a pretextual or trivial limitation on the effective scope of the claim.

IV. COMPUTER-IMPLEMENTED INVENTIONS ARE PERVASIVE AND ESSENTIAL IN THE MODERN ECONOMY, SO IPO URGES CAUTION AGAINST UPSETTING DECADES OF SETTLED EXPECTATIONS REGARDING THEIR LEGAL PROTECTION VIA PATENT RIGHTS

Clearly, over the past half century, computer-implemented inventions have become vastly important to technological advancement. Because much of today's scientific progress necessarily involves computers, courts should tread carefully in devising categorical rules that might preclude legitimate advances in the computer arts from being patentable. These advances involve not only physical computer hardware, but also the software that turns general purpose hardware into useful machines. Many of the functions historically performed by mechanical assemblies and virtually all of the functionality of hard-wired electronic circuitry can be performed today through programmable devices. Most modern telephones, radios and other electronic devices are essentially computers with embedded but modifiable programs installed in non-volatile memory.

In order to fully appreciate the critical necessity of patent eligibility for computer-implemented inventions as guided by this Court's precedent, it is useful to have a general understanding of computing technology, including the interrelationship between computing hardware and software. At a high level, computers work when software is activated to control hardware components to carry out computerized actions. Thus, software animates hardware to cause a computer to perform useful actions. A computer consists of both hardware and software, but hardware and software are interdependent upon one another to carry out real-world, physical tasks. "The hardware of a computer is useless unless appropriate software is available to perform different tasks. Similarly software cannot run without hardware. Therefore software and hardware are completely interdependent on each other." Deepali A. Godse, *Computer Programming* 1-7 (Technical Publications 2007). The real-world impact of software is evident from any software upgrade process. "When additional software is made available on a computer system, the functionality of the system is enhanced. Thus even while the hardware components of a system remain unchanged, its usefulness is increased by the newly added software." Naresh D. Jotwani, *Computer System Organization* 311 (McGraw-Hill Educ. 2009).

Broadly speaking, computers may be divided into embedded computers and conventional computers. A "conventional computer" generally refers to a server, desktop, or laptop computer, mobile devices such as tablets and smartphones, or other computing devices. By contrast, embedded computers are often concealed inside a device and are frequently overlooked. One designer notes "[e]mbedded computers are far more numerous than desktop systems, but far less obvious. In fact, [the average person] has more than 30 or more [embedded computers], hidden inside TV's, VCR's, DVD players, remote controls, washing machines, cell phones, air conditioners, game consoles, ovens, toys, and a host of other devices." John Catsoulis, *Designing Embedded Hardware* 1 (2nd ed., O'Reilly 2005). In modern times we are literally surrounded by both conventional and embedded computers, though we are often unaware that software is also running on our many embedded computers.

Whether running an embedded computer or a conventional computer, software has a real, tangible existence, and precisely defined operation. At the lowest information level, a computer program consists of an organized sequence of binary ("on" or "off") values usually represented as a "1" or "0," respectively, over some segment of storage. And this information is organized into "instructions" that have well-defined process operations associated with corresponding computer hardware. *See* David A. Patterson & John L. Hennessy, *Computer Organization and Design* 6 (2nd ed. 1998). The physical manifestation of binary information within a computer varies according to storage technology. In a magnetic disk, binary information is stored by orienting a magnetic field within a portion of a magnetic film in the disk relative to a directional reference. *See* Ron White, *How Computers Work* 159 (9th ed. 2008). Within Random Access Memory (RAM) a charge associated with a transistor stores a "1."

Within flash memory a "1" is stored as a difference in charge between two transistors. *Id.* at 61. Regardless of the storage technology, instructions control the operation of semiconductor hardware. Instructions perform operations within computer hardware such as arithmetic operations, logical operations, branch operations, etc. Through the sequential operation of such instructions, software controls other devices such as printers, displays, communication ports, networks, modems, speakers, etc. (in the conventional computer context).

The execution of a typical program illustrates that software implemented processes perform rapid activation and deactivation of transistors. A computer typically has: memory that stores an instruction sequence forming a program, a register file that stores intermediate results, a control block, a datapath element, an input interface and an output interface. *See* Patterson & Hennessy, *supra,* at 16. All of these elements are built from transistors that are either activated or deactivated under the control of software. *See, e.g., id.* at 14-15, 23, 31, and 106. Execution of a program begins when the computer is told to begin executing a sequence of instructions beginning with the first instruction of a program. *Id.* at 122. Each instruction operates on the information stored within the transistor elements to fetch operands from memory, to combine operands through arithmetic or logical operations, and to store a result. A software program in a modern computer can perform at least hundreds of millions of such operations per second. *See* Paul Vanezia, *Chip Wars, Intel Strikes Back,* 26 Info World 40 (Aug. 2, 2004). Thus, the execution of software processes activates and deactivates millions of transistors in the course of performing useful functions for the computer user.

At the core of the computer hardware is the processor that consists of a control unit and a datapath element. *See* Patterson & Hennessy, *supra*, at 14. A hardware processor supports multiple instruction types, such as multiply, add, load, store, branch, etc. For each instruction type the processor looks at the content of the software instructions to decode the instruction type, and on this basis rewires pathways between memory, the register file, control and the data pathway hardware elements to carry out the instructions. This rewiring is effected by state changes of the transistors that implement the control and datapath elements. *Id.* at 339-343. In essence, software instructions literally, but temporarily, reconfigure electronic pathways between transistors and transform the computing hardware with tangible information that defines precise operations to perform real, useful, and physical activity.

Not only are software and hardware components interdependent, but in many cases they are interchangeable, as many computing functions can be implemented by hardware components, software components, or a combination of hardware and software components. An algorithm that is implemented in a computer through the use of software can be replaced by a special-purpose hardware component that performs the same function but does not directly use software. Likewise, a portion of hardware can often be eliminated from a computer system, and the function of that portion can be performed instead by the computer using software. Computer system developers understand that "you can think of the algorithm as a combination of hardware components and software components…[y]ou can implement that algorithm purely in software…purely in hardware…or in some combination of the two." Arnold S. Berger, *Embedded Systems Design:*

An Introduction to Processes, Tools and Techniques 8 (CRC Press 2001). Of course, as stated earlier, when an algorithm is implemented "purely in software," it does not perform the algorithm without any hardware, but necessarily controls hardware components to carry out computerized actions.

Indeed, software has been described as "the new physical infrastructure of the information age" and should be accorded commensurate protection in the patent system. *Report to the President, "Information Technology Research: Investing in Our Future,"* President's Information Tech. Advisory Comm. (PITAC), Nat'l Coordination Office for Computing, Info. & Comms. (1999). The U.S. Department of Commerce approximates U.S firms invested $126.3 billion of R&D into the U.S. Software and IT Services Industry in 2011. *See The U.S. Software and IT Services Industry,* U.S. Dep't of Commerce, available from: http://selectusa.commerce.gov/industry-snapshots/software-and-information-technology-services-industry-united-states (last visited Jan. 13, 2014). The $126.3 billion invested by U.S. companies represents a significant amount of private outlay.[4] For decades computer-implemented innovations have served as a major catalyst for U.S. economic growth and vitality. *See, e.g.,* Dale W. Jorgenson, Mun S. Ho, and Kevin J. Stiroh, *Productivity Volume 3: Information*

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[4] A study by the National Science Foundation found overall U.S. spending on research and development totaled $428 billion in 2011 and approximately $294.1 billion was the result of private businesses. *See* Mark Boroush, *U.S. R&D Resumes Growth in 2011 and 2012, Ahead of Pace of the Gross Domestic Product,* InfoBrief (Nat'l Center for Sci. and Eng'g, Dec. 2013) at 1, *available at*: www.nsf.gov/statistics/infbrief/nsf14307/nsf14307.pdf.

Technology and the American Growth Resurgence, Cambridge: MIT Press (2005), at 9-14.

The speed with which computer and software technologies have changed the world is both profound, and deeply realized, such that nearly every aspect of our society is touched by these discoveries. The growing importance of software has led those knowledgeable on the subject to conclude that software is "the single biggest driver of productivity growth." William J. Raduchel, *The Economics of Software, in Measuring and Sustaining the New Economy Software, Growth, and the Future of the U.S. Economy: Report of a Symposium*, at 37-38 (Dale W. Jorgenson et al. eds., National Academic Press, 2006), available from: http://nap.edu/catalog/11587.html. In short, computer-implemented inventions play a significant role in the U.S. economy.

The far-reaching impact of computer-implemented innovations is evidenced by the wide scope of applications in practically all sectors of the economy, and the deeply pervasive way our society is influenced by these innovations – from the routine, such as receiving newspapers – to the profound, such as literally saving lives. Utilizing eICU technology that combines software, video feed, and real-time patient information, specialists at Sentara Norfolk General Hospital in Norfolk, VA, are able to cover eleven ICUs at six hospitals, spread sixty miles apart, around the clock.[5] *See* Timothy J. Mullaney,

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[5] The eICU technology enabled doctors at two hospitals in the Sentara system to reduce deaths by 27 percent in the first year, reduce costs per ICU case by about 25 percent, and cut nearly an entire day off of the average patient's ICU stay from 4.4 to 3.6 days. *Id.*

The Doctor Is (Plugged) In, BusinessWeek.com (Jun. 25, 2006), available from: www.businessweek.com/magazine/content/06_26/b3990076.htm.

Greater investment in computer-implemented technologies is associated with greater productivity and growth for individual businesses and the country. In fact, numerous scholarly studies since the mid-1990s have found "positive and significant effects" of hardware, software, applications and telecommunications on productivity. *See* Robert D. Atkinson & Andrew S. McKay, *Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution*, 10 Info. Tech. & Innovation Found., at 14 (2007) (quoting Jason Dedrick, ViJay Gurbaxani, and Kenneth L. Kraemer, *Information Technology and Economic Performance: A Critical Review of the Empirical Evidence*, ACM Computing Surveys 35.1 (Mar. 2003), at 12).

Computer-implemented technologies have made it easy and efficient for individuals with responsibilities to care for dependents (either children or aged parents) to work part-time from the home, particularly because "[c] omputers, software, video displays, and digital switching technologies make it possible for the home to be as connected as to work as an office." *Id.* at 35. Even in leisure activities, computer-implemented inventions are at the heart of various advances from more efficient gas-electric hybrid cars to receiving the newspaper. Notably, compared to reading a newspaper, receiving the news on a wireless mobile device results in the release of 32 to 140 times less CO^2, and several orders of magnitude less NOx and SOx. *See* Michael W. Toffel and Arpad Horvath, *Environmental Implications of Wireless Technologies:*

News Delivery and Business Meetings, 38 Environmental Science & Technology 2961, 2964 (July, 2004) (measuring effects based on AvantGo and EIO-LCA software).

Innovation and investment in IT-utilizing industries was the main source of sustained U.S. productivity growth from 2000-2007. *See* Dale W. Jorgenson, Mun Ho, and Jon Samuels, *Information Technology and U.S. Productivity Growth: Evidence from a Prototype Industry Production Account*, at 18 (Nov. 19, 2010), *available at*: https://scholar.harvard.edu/files/jorgenson/files/02_jorgenson_ho_samuels19nov20101_2.pdf. Notably, computer-implemented innovations are not owned only by software companies. In fact, "[t]he majority of the software patents acquired during the past twenty years have been acquired by non-software firms in the information and communication technology sector," and the firms that acquired these patents "had a slightly higher market value than those with no software patents." Bronwyn H. Hall and Megan MacGarvie, *The Private Value of Software Patents*, Research Policy Paper, at 53-54 (2009), *available at*: http://elsa.berkeley.edu/~bhhall/papers/HallMacGarvie_Dec09.pdf. Indeed, computer-implemented innovations have leveled the research and development playing field between large and small companies and dramatically increased competitiveness "[b] ecause small and mid-sized firms can now better compete in product markets, they have dramatically increased their R&D investments." Robert M. Hunt & Leonard I. Nakamura, *The Democratization of U.S. Research and Development after 1980*, Society for Economic Dynamics, Meeting Paper 121 (2006) (noting also that while the R&D to GDP ratio more than doubled between 1980 and 2000, almost all of the increase was because small and mid-sized firms with fewer than 5,000 employees increased their R&D investments). Software applications, particularly, extend to all aspects of the economy, including internal operations of organizations (business, government, and non-profit), transactions between organizations, and transactions between individuals. *See* Robert Atkinson, *Digital Prosperity* at 7 (explaining the development of computers and software incorporating graphical user interfaces made it possible for non-highly-trained people to exploit the benefits of information technology).

Clearly, American life is characterized at all stages by interactions with technology. As such, the pervasiveness of computer-implemented innovations form an essential part of the cross disciplinary impetus for most innovators. For example, the development of new software often requires collaboration between those who are experts in computer languages, those who are knowledgeable about the human-computer interface, and those with domain expertise in the areas of software application. *See* Fred Block & Matthew R. Keller, *Where do Innovations Come From? Transformations in the U.S. National Innovation System, 1970-2006*, The Information Technology & Innovation Foundation, July 2008.

Affording patent protection to computer software innovations advances the goals of the Patent Act. "[B]oth economic theory and practical experience suggest that the availability of patents for software promotes innovation by supplying (additional) incentives to inventors." Julie E. Cohen and Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 Cal. L. Rev. 1, 5 (2001); *see also* Bradford L. Smith and Susan O. Mann, *Innovation and Intellectual Property Protection in the Software*

Industry: An Emerging Role for Patents, 71 U. Chi. L. Rev. 241, 244 (2004) ("[P]atent protection for software provides a desirable form of protection for many forms of software innovation and may offer a more effective mechanism than either copyright or trade secret law for balancing incentives for innovation against the goals of interoperability and transparency.")

The economic case for computer-implemented innovations underscores that "the integration of IT into virtually all aspects of the economy and society [has] creat[ed] a digitally-enabled economy that is responsible for generating the lion's share of economic growth and prosperity." *See* Robert Atkinson, *Digital Prosperity* at 3. Dramatically reshaping the widespread expectations and reliance on patents for computer-implemented technologies would cause massive uncertainty in what is nearly a half-trillion dollar (annually) thriving market for innovation despite recent economic challenges. As four members of this Court cautioned in explaining their rejection of the machine-or-transformation test as the sole test for patent eligibility, courts must take care to avoid undermining the intended incentives of patent protection for computer-related inventions and other new technologies:

> The machine-or-transformation test may well provide a sufficient basis for evaluating processes similar to those in the Industrial Age – for example, inventions grounded in a physical or other tangible form. But there are reasons to doubt whether the test should be the sole criterion for determining the patentability of inventions in the Information

> Age. As numerous amicus briefs argue, the machine-or-transformation test would create uncertainty as to the patentability of software, advanced diagnostic medicine techniques, and inventions based on linear programming, data compression, and the manipulation of digital signals.

Bilski 130 S. Ct. 3218, 3227 (internal citations to *amicus* briefs omitted).

Thus, it has been well established from the earliest days of patent jurisprudence that a method or system that permits or enables a machine to perform a new and useful task is eligible for patent protection, and this principle applies to computers and computer-implemented inventions at least to the same extent as any other man-made devices.

CONCLUSION

Over the last 50 years, computers and other programmable devices have become the principal means to perform the type of functions that have historically been performed by many mechanical devices or hard-wired circuitry, and it is critical to preserve patent protection for inventors who create ways to harness the capabilities of computers to perform new and useful functions. Computer-implemented inventions, like all technological advances, rely to some extent on fundamental laws of nature and abstract principles. Relying on fundamental laws of nature and abstract principles have never been, and should not become, a barrier to patentability. So long as an invention claims a specific and practical application of computer technology to accomplish a new and useful goal, and complies with the fundamental requirements imposed by the courts on all inventions, it should be eligible for patent protection under Section 101 of the Patent Act.

Respectfully submitted,

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AMICUS
CURIAE
BRIEF

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IN THE

Supreme Court of the United States

ALICE CORPORATION PTY., LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF AMICUS CURIAE INTERNATIONAL ASSOCIATION FOR THE PROTECTION OF INTELLECTUAL PROPERTY (ASSOCIATION INTERNATIONALE POUR LA PROTECTION DE LA PROPRIETE INTELLECTUELLE) IN SUPPORT OF NEITHER PARTY

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I. INTEREST OF AMICUS CURIAE

This brief is submitted on behalf of *amicus curiae* the International Association for the Protection of Intellectual Property Association Internationale Pour la Protection de la Propriete Intellectuelle ("AIPPI"), through its United States national group, which operates as a division of the American Intellectual Property Law Association, the AIPPI-United States Division.[1]

AIPPI is an international organization, founded in 1897, dedicated to the development, improvement, and legal protection of intellectual property. AIPPI is a politically neutral, non-profit organization headquartered in Switzerland having over 8,800 members representing over 100 countries and operating mainly through National Groups, such as the AIPPI-US Division.

The members of AIPPI include intellectual property lawyers, patent, copyright and trademark attorneys, and patent agents in corporate and private practice throughout the world, as well as academics and other persons interested in intellectual property, and including members from

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[1] In accordance with Supreme Court Rule 37.6, AIPPI states that this brief was not authored, in whole or in part, by counsel to a party, and that no monetary contribution to the preparation or submission of this brief was made by any person or entity other than AIPPI or its counsel.

North America, South America, Europe, Asia, Australia and Africa. AIPPI is organized into 64 National and Regional Groups, and its members participate by joining one of these groups.

AIPPI promotes the protection of intellectual property on a national and international basis by studying and comparing existing laws and proposing new laws and international and regional treaties and agreements relating to intellectual property. In its long history, AIPPI has adopted more than 700 Resolutions and Reports. AIPPI's Resolutions are published in English, French and German, and are provided to international and national intellectual property organizations around the world. The presentation of these Resolutions and Reports to international Governmental Organizations, such as the World Intellectual Property Organization ("WIPO"), has contributed considerably to the development, improvement and harmonization of the international protection of intellectual property.

AIPPI has adopted two Resolutions that have particular relevance to the issues in this case: Resolution Q133, on the "Patenting of computer software," and Resolution Q158, on the "Patentability of Business Method[s]." These Resolutions can be found in the appendix to this brief and are discussed below.

Pursuant to this mission, AIPPI submits this brief on behalf of both resident and non-resident

AIPPI members who seek patent protection in the United States for inventors they represent.[2]

II. INTRODUCTION

The framers of the United States Constitution recognized the need to encourage innovation, and dissemination of the same, by rewarding inventors, and granted Congress the authority "To promote the Progress of Science and *useful Arts*, by securing for limited Times to Authors *and Inventors* the exclusive Right to their Writings *and Discoveries*." U.S. Const. art. I, § 8, cl. 8 (emphasis added).[3]

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[2] AIPPI sought consent to file this brief from the counsel of record for all parties, pursuant to Supreme Court Rule 37.3(a). Counsel for both parties have filed with the Clerk general consent letters to the filing of amicus briefs in support of either or neither side in this case.

[3] The framers of the Constitution actually intended to set up two systems with this clause: first, a copyright system, which would pertain to authors and would protect the dissemination of "science" in the broad sense of "knowledge" in general (rather than laboratory or experimental science) by granting rights to authors in their writings; and second, a patent system, which would promote the progress of the "useful Arts" by granting rights in their discoveries. *See In re Bergy*, 596 F. 2d 952, 958-59 (C.C.P.A. 1979) (Rich, J.), *aff'd sub nom. Diamond v. Chakrabarty*, 447 U.S. 303 (1980); *see also* H.R. Rep. No.1923, 82d Cong., 2d Sess. 4 (1952); S. Rep. No.1979, 82d Cong., 2d Sess. 3 (1952), U.S. Code Cong. & Admin. News 1952, pp. 2394, 2396 (legislative history reports accompanying the Patent Act of 1952, explaining that the purpose of the patent laws is to promote the progress of the "useful arts").

Congress followed by enacting the first United States Patent Act in 1790 requiring, *inter alia*, the applicant to "have invented or discovered any useful art, manufacture, engine, machine, or device, or any improvement therein." Act of April 10, 1790, ch. 7, § 1, 1 Stat. 109. Congress amended this Act in 1793 to require that the applicant "have invented any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement." Act of February 21, 1793, ch. 11, § 1, 1 Stat. 318. In the Patent Act of 1952, Congress amended the language of 35 U.S.C. § 101 to use the term "process,"[4] in lieu of "art," stating: "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." The Patent Act of 1952 also specified that claimed inventions had to be novel (35 U.S.C. § 102), non-obvious (35 U.S.C. § 103), and be fully and particularly described (35 U.S.C. § 112).

This Court has made the threshold determination of patent-eligible subject matter under § 101 a broad and flexible analysis, to permit accommodation of new areas of innovation and ensure that "ingenuity should receive liberal encouragement." *See generally Bilski. v. Kappos*, 561 U.S. ___, 130 S. Ct. 3218 (2010); *Diamond v. Diehr*, 450 U.S. 175 (1981); *Diamond v. Chakrabarty*, 447 U.S. 303 (1980); *Parker v. Flook*, 437 U.S. 584 (1978); *Gottschalk v. Benson*, 409 U.S. 63 (1972). The United States has historically been a leader in innovation. Manufacturing, chemistry, electronics, biotechnology, and computer software are just a few of the technological fields that have seen tremendous commercial development within the United States. This Court's flexible determination of patent eligible subject matter has accommodated and fostered innovation in and development of all of these technologies, and has helped the United States to maintain its leadership position in the global economy, despite a waning manufacturing base.

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[4] The new use of the term "process" did not alter the scope of patent eligibility over processes because "[i]n the language of the patent law, [a process] is an art." *Diamond v. Diehr*, 450 U.S. 175, 182-84 (1981). 35 U.S.C. § 100(b) defines "process" to mean "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."

In this case, the United States Court of Appeals for the Federal Circuit ("Federal Circuit") granted CLS Bank's petition for rehearing *en banc*, seeking review of the Federal Circuit's panel holding that Alice Corp.'s asserted claims from four patents concerning an invention for a computerized system for creating and exchanging financial instruments, such as derivatives were invalid under 35 U.S.C. § 101 as patent-ineligible subject matter. In its *en banc* order, the Federal Circuit asked that the parties and amici address two questions that the intellectual property community throughout the world hoped would clarify the jurisprudence concerning patent eligibility of computer-implemented inventions: (1) "What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible 'abstract idea'; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise ineligible abstract idea?", and (2) "In assessing patent eligibility under 35 U.S.C. § 101 of a computer-implemented invention, should it matter whether the invention is claimed as a method, system, or storage medium; and should such claims at times be considered equivalent for § 101 purposes?"

In its brief, one-paragraph, *per curiam* opinion, the Federal Circuit's en banc decision affirmed the district court's holding that the claims at issue were not directed to patent-eligible subject matter. Unfortunately, the Federal Circuit's six opinions that followed the *per curiam* opinion did not clarify the jurisprudence on patent eligibility of computer-implemented inventions. Rather, those opinions reflected a serious divide in the court concerning the future of patents on computer-implemented inventions. In fact, the Federal Circuit's six non-precedential opinions have created uncertainty concerning the patent eligibility of such inventions not only in the United States but also throughout the world.

This brief attempts to serve the Court by providing both a global perspective on the issue of patent-eligible subject matter for computer-implemented inventions, particularly software and business methods that are implemented through the use of computers, and a commentary on what national policies should govern the issue of when such inventions should be eligible for patenting under 35 U.S.C. § 101.

III. SUMMARY OF THE ARGUMENT

AIPPI urges this Court not to impose any bright-line or rigid rules that would apply to determining the "abstractness" of computer-implemented inventions. Rather, the Court should adopt an approach here that will allow any computer-implemented inventions that produce a useful result—which otherwise comply with the requirements for patentability (35 U.S.C. §§ 102, 103, and 112) and do not fall within one of this Court's case-imposed exceptions ("laws of nature, physical phenomena, and abstract ideas")—to be considered as patent-eligible subject matter. This approach would be consistent with the world-wide consensus that computer-implemented inventions should be treated in the same way as any other invention.

AIPPI studies and compares the way patent systems around the world protect intellectual property and makes recommendations for harmonization and improvement of those systems. This includes how the major patent systems determine the threshold issue of what constitutes patent-eligible subject matter. Treaties, such as the Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS"), ratified by the United States and much of the world, espouse a flexible approach to patentability. *See* Agreement on Trade-Related Aspects of Intellectual Property Rights, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments—Results of the Uruguay Round, 33 I. L. M. 1197, 1869 UNTS 299 (1994). AIPPI, by passing Resolutions Q133 and Q158, has encouraged its member countries to coordinate their systems in allowing broad flexibility in establishing the standard for determining subject matter patentability for computer-implemented inventions and business methods.

With this Court's decision to grant *certiorari* in this case to clarify the standards of patentability for computer-implemented inventions, AIPPI believes the United States has the opportunity to be a world leader, by setting a flexible threshold for subject matter patentability in this area. In fact, AIPPI respectfully submits that narrowing the scope of patent eligibility for computer-implemented inventions in this case would be a step backward for the United States.

Nor should this Court require that computer-implemented inventions be claimed in any particular format (such as a method, system, or storage medium). Rather, the claim form should be dictated by the market needs, practicability, and the various manners in which such computer-implemented innovations can be commercialized and improperly copied.

Once it is clear a computer-implemented invention is able to meet this flexible standard of patent eligibility, it would still have to meet the additional statutory requirements of novelty, non-obviousness in comparison to the prior art, and adequate disclosure, in order to be entitled to patent protection.

IV. ARGUMENT

The questions before this Court include whether the Federal Circuit erred in holding that the asserted claims of Alice's four patents, which were in three forms - (1) "methods" for exchanging transaction obligations; (2) "computer readable storage media" containing a program for exchanging obligations; and "(3) systems" comprising data storage and a computer for exchanging obligations - were all not patent eligible subject matter under 35 U.S.C. § 101. In deciding those questions, the Federal Circuit again attempted to set forth some "bright-line" or rigid tests, in an effort to guide the courts and the intellectual property community in deciding the questions of subject matter eligibility for a particular category of invention. However, the Federal Circuit was unable to reach agreement on this issue, which AIPPI believes is a reflection of the fact that a bright-line or rigid rule is indeed inappropriate.

This Court has wisely declined to place bright-line limits on the broad statutory grant of patent eligibility for "any" new and useful process, beyond excluding patents for "laws of nature, natural phenomena, and abstract ideas." *Diamond v. Diehr,* 450 U.S. 175, 185 (1981).

Consistent with AIPPI policy, reflecting an international consensus on the need to protect computer-implemented inventions, AIPPI respectfully submits that this Court should take this opportunity to state that patent-eligible subject matter under Section 101 should extend broadly to all areas of computer-implemented technology, including software programs, in any medium in which it can be commercialized. (*See* AIPPI Resolution Q133 (Appendix A hereto) at paras. 1, 4, 7 (enacted April 1997)).

This Court's past precedent on subject matter patentability for computer-implemented inventions and business methods, including *Benson, Flook, Diehr*, and *Bilski,* has consistently reflected a flexible approach. In fact, the Court has already made clear that the scope of Section 101 is not only "expansive" and "extremely broad," but is also "*dynamic.*" *See Chakrabarty*, 447 U.S. at 308; *see also J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.*, 534 U.S. 124, 130, 135 (2001). In *Bilski*, this Court specifically rejected the Federal Circuit's attempt to draw a "bright line" rule for determining subject matter eligibility for business method processes. 561 U.S. at ___, 130 S. S. Ct. at 3227.

Nor should this Court impose a bright-line rule for measuring the subject-matter patent eligibility of computer-implemented inventions. Rather, the Court should adopt an approach here that allows for patent eligibility of all new and non-obvious computer-implemented inventions, including software and inventions used in industrial, commercial, and financial activities (i.e., computer-implemented business methods), so long as those inventions produce a useful result and do not fall within one of this Court's case-imposed exceptions: "laws of nature, physical phenomena, and abstract ideas." *See Bilski*, 561 U.S. at ___, 130 S. Ct. at 3225; *see also Mayo Collaborative Servs. v. Prometheus Labs.*, 566 U.S. ___, 132 S. Ct. 1289, 1293 (2012).

Further, the Court should not establish different rules for subject matter eligibility for different sorts of claims of computer-implemented inventions, such as a method, system, or storage medium. (*See* AIPPI Resolution Q133 (Appendix A hereto) at paras. 8, 9). In addition, with the widespread use of computers to implement inventions used in industrial, commercial, or financial activities, such as the invention at the core of this case by Alice Corp., AIPPI also submits that such computer-implemented inventions on business methods should also be treated no differently, to the extent they are new, non-obvious, and meet the disclosure requirements. Such inventions when claimed too broadly would still presumably be found to be unpatentable under the existing test for "lack of usefulness," and then analyzed for novelty, non-obviousness, and adequate disclosure. (*See* AIPPI Resolution Q158 (Appendix B hereto) at paras. 1, 3 (enacted March 2001)).

A. There is a World-Wide Consensus That Computer-Implemented Inventions Should be Treated the Same as Other Inventions.

1. AIPPI believes there should be no special rules to characterize a computer-implemented invention as an "abstract idea."

The patentability of computer and software related innovations has been the subject of much debate throughout the world for over 50 years, due in no small part to both their commercial value, and relative ease of misappropriation. However, a worldwide consensus among AIPPI members has developed that, as a matter of principle, as reflected in the TRIPs agreement and as a matter of economic reality, patents should be granted on computer software inventions on an equal footing with all other areas of technology. (See AIPPI Resolution Q133 (Appendix A hereto) at para. 1).[5]

Due to the widespread use of computers in all fields of industrial, commercial, and financial activities (i.e., "business methods"), a similar consensus has developed that patents should be granted on computer-implemented inventions for business methods. (See AIPPI Resolution Q 158, Appendix B hereto, paragraph 1).[6] And as the economies of the industrialized countries have become increasingly dependent on service industries, to which software and business method patents are important, the eligibility of patent protection for computer programs and business methods has become critical for the United States and world economies.

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[5] Question Q133, on the "Patenting of Computer Software" was a question first studied by committees of the National Groups of the members of AIPPI, then debated at the Vienna AIPPI Congress in 1997, resulting in a Final Report and Resolution that was passed in April 1997.

[6] Question Q158, on the "Patentability of Business Method[s]" was a question first studied by committees of the National and Regional Groups of the members of AIPPI, then debated at the Melbourne Congress in 2001, resulting in a Final Report and Resolution that was passed in March 2001.

Among the reasons that the worldwide innovation community has come to this consensus is that the creation of computer-implemented inventions generally requires considerable technical complexity. (See AIPPI Resolution Q133 (Appendix A hereto), Reason A). For example, computer-software-related inventions involve by their nature the use of a computer, computer network or other programmable apparatus. The dividing line between computer hardware and software is actually becoming increasingly blurred, and it would not make sense technically to apply a special rule to any sort of computer-implemented invention simply because it was characterized as "software" or hardware. The fact that computer software itself involves merely abstract data handling operations should not exclude it from being eligible for patent protection, so long as it produces a useful result, in accordance with § 101. (*See* AIPPI Resolution Q 133 (Appendix A hereto), Reason E) Therefore, AIPPI urges that all computer-implemented inventions which produce a useful result should be considered to be subject matter eligible for patent protection under § 101, and no special test should be applied to determine whether they seek to cover an "abstract idea."

Such a broad approach to subject matter eligibility for computer-implemented inventions would be consistent with the most relevant international treaty that addresses intellectual property laws. The TRIPS agreement, to which the United States and most European countries are signatories, defines patentable subject matter in a broad and flexible manner, consistent with Supreme Court precedent:

> Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Subject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to . . . the field of technology . . . .

TRIPS, supra Section III, at Art. 27, para. 1.[7] Article 27 provides very limited possibilities for exclusions from patentability, namely, exclusions based on public order or morality, and exclusions for diagnostic, therapeutic and surgical methods, as well as for plants and animals. *Id.* at para. 2-3. The North American Free Trade Agreement ("NAFTA"), to which the United States also adheres, includes a similarly broad and flexible definition of patentable subject matter:

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[7] See also Vienna Convention on the Law of Treaties, May 23, 1969, Part III, Observance, Application And Interpretation Of Treaties, Section 3: Interpretation of Treaties, Art. 31, General Rule of Interpretation, para. 1, stating "[a] treaty shall be interpreted in good faith in

> 1. Subject to paragraphs 2 and 3, each Party shall make patents available for any inventions, whether products or processes, in all fields of technology, provided that such inventions are new, result from an inventive step and are capable of industrial application. For purposes of this Article, a Party may deem the terms "inventive step" and "capable of industrial application" to be synonymous with the terms "non-obvious" and "useful," respectively.
>
> 7. Subject to paragraphs 2 and 3, patents shall be available and

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accordance with the ordinary meaning to be given to the terms of the treaty in their context and in light of its object and purpose."

> patent rights enjoyable without discrimination as to the field of technology . . .

North American Free Trade Agreement, U.S.-Can.-Mex., art. 1709, para. 1, 7, Dec. 17, 1992, 32 I.L.M. 289 (1993).

What emerges from reading the relevant provisions of these treaties, as well as the AIPPI resolutions discussed above, is a sound patent policy developed by international intellectual property experts and users of the patent system on subject matter patentability. That policy does not prescribe rigid eligibility rules or special tests to be applied to any area of technology, including computer software or computer-implemented business methods. Rather, patents should be available in all fields, and sound patent policy advises that more granular limitations on patentability may be imposed through the novelty, non-obviousness ("inventive step"), and disclosure (written description, enablement, and indefiniteness) requirements. These requirements, properly policed by the Patent Office and courts, all must be met for patentability, and enjoy time-tested analogues in other major patent systems around the world that demonstrate the advisability of using these granular tools for granular analysis, rather than attempting to rely on the statutory subject matter test—by design a very general, coarse test not suited for granular analysis—for more precision that it can deliver.

In fact, the international consensus that there should be no rigid rule restricting patent eligibility for patents on computer-implemented inventions dates back to at least 1997, when AIPPI passed its resolution on computer software. If this Court were to establish a rigid rule here, it would not only be a step backward, but it would also make the United States one of the only industrially advanced countries moving in that direction (*see, e.g.*, section III.C. 2. *infra*, discussing software patent eligibility in Europe, Canada, and Japan).

Some of the vague tests suggested by the Federal Circuit opinions in its *en banc* decision in this case fail to recognize these realities. There is no reason to presume that computer-implemented inventions are necessarily more prone to "abstractness" than other sorts of inventions. The tests proposed in the Federal Circuit's opinions have not articulated a principled basis for applying a different set of rules for computer software, as compared to other fields of technology, or for distinguishing between the different types of computer-implemented inventions or software. AIPPI thus respectfully submits that any test for patent-eligible subject matter set forth by this Court that would function as any sort of "bright line" or rigid filter to exclude broad categories of computer-implemented inventions should be rejected as a threat to innovation.

2. AIPPI believes that computer-implemented inventions should not be restricted to any particular form of claims.

The Federal Circuit also asked the *en banc* parties to brief whether, in assessing patent eligibility under 35 U.S.C. § 101, it should matter if a computer-implemented invention is claimed as a method, system, or storage medium? Consistent with Resolutions Q133 and Q158, AIPPI respectfully submits that patents on all areas of computer-implemented technology, including computer software and inventions concerning industrial, commercial and financial activities implemented using a computer, regardless of how those inventions are claimed,[8] should be eligible subject matter, so long as they meet the other conditions of patentability. Computer software should be patent-eligible in any medium in which it can be commercialized, and patentability should not hinge on the type of software or the medium on which the software resides or is carried. (AIPPI Resolution Q133 (Appendix A hereto), paras. 5, 7). Likewise, the same criteria should be used to evaluate the patentability of all inventions, including methods used in all fields of industrial, commercial and financial activities. (AIPPI Resolution Q158 (Appendix B hereto), para. 3). In other words, inventions claimed as computer-implemented business methods should not be considered to be necessarily inherently "more abstract" or more likely abstract than inventions claimed as a "system" or "storage medium."

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[8] Any claim must still be within one of the statutory categories allowed under 35 U.S.C. § 101: process, machine, manufacture, or composition of matter.

Applying unduly-restrictive criteria to certain technical fields is antithetical to innovation. This applies to computer-implemented inventions in software and business methods (*See* AIPPI Resolution Q133 (Appendix A hereto), para. 8, Reason B; *see also* AIPPI Resolution Q 158 (Appendix B hereto), paras. 3, 6). An inventor should have the freedom to protect innovations in ways that reflect market needs, practicability, and the various manners in which such innovations can be commercialized and misappropriated. Limiting patent-eligibility of computer-implemented inventions to a certain form may force such inventors to rely on theories of indirect infringement to protect their inventions, which would involve additional evidentiary burdens.[9] This could relegate some computer-implemented inventions to a less effective form of protection than that available for other types of inventions.

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[9] *See* 35 U.S.C. §§ 271(a)-(c); *see also Ricoh Co., Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325, 1335 (Fed. Cir, 2008) (holding the sale of disc drives that include "software containing instructions to perform a patented method does not infringe the patent under § 271(a)" because infringement of a method claim requires performing the actions described in the claim and "software is not itself a

Therefore, AIPPI respectfully submits that this Court should hold that computer-implemented inventions, in whatever form such inventions are claimed (method, system, or storage medium), should be broadly considered statutory subject matter under 35 U.S.C. § 101.

B. This Court Should Establish a Simple, Flexible Test for Determining Patent Eligibility for Computer-Implemented Inventions.

So long as they meet the other statutory criteria of patentability under 35 U.S.C. § 102 (novelty), § 103 (non-obviousness), and § 112 (adequate disclosure), AIPPI submits that all computer-implemented inventions that produce a useful result should be considered eligible for patent protection, in the same manner given to other advances in technology.

1. This Court's historic flexibility in subject matter jurisprudence has

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sequence of actions, but rather it is a set of instructions that directs hardware to perform a sequence of actions.")

allowed the patent law to adapt to evolving technologies.

The determination of whether an invention is patent-eligible subject matter under Section 101 has historically been met with a flexible analysis sufficient to accommodate new technologies. *See Chakrabarty*, 447 U.S. at 307. Thus, the Court has applied a flexible approach to determining patent-eligibility of articles of manufacture and compositions of matter, two of the other enumerated statutory classes in Section 101. In doing so, the Court stressed that Section 101 was meant to be interpreted broadly to accommodate innovation. *Chakrabarty*, 447 U.S. at 308-09.

For example, in *Chakrabarty*, the Court held that a genetically-engineered bacterium was a patentable manufacture or composition of matter under Section 101. *Chakrabarty*, 447 U.S. at 310. In doing so, the Court stressed that "[i]n choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any, Congress plainly contemplated that the patent laws would be given wide scope." *Id.* at 308. The Court emphasized the goals of the patent system, noting that "[t]he Act embodied Jefferson's philosophy that 'ingenuity should receive a liberal encouragement.'" *Id.* (citations omitted). To that end, the Court, in dealing with this cutting-edge technology, rejected the argument that the bacterium was "a hitherto unknown natural phenomenon." *Id.* at 309. Rather

Chakrabarty's "discovery is not nature's handiwork, but his own; accordingly it is patentable subject matter under § 101." *Id.* at 310. *Chakrabarty* cited with approval the statement in *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480-481 (1974), that the authority conveyed under Art. I, § 8, cl. 8 of the Constitution is exercised in the hope that "the productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes." *Chakrabarty*, 447 U.S. at 307 (citations omitted). *Chakrabarty* likewise emphasized that "[t]he Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to 'include anything under the sun that is made by man.'" *Id.* at 309 & n.6 (citing S. Rept. No. 1979, 82d Cong., 2d Sess., 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952)).

The judgment on which the *Chakrabarty* decision was based, and which was appealed to this Court, included another patent-eligible subject matter case, *In re Bergy*, 596 F.2d 952 (C.C.P.A. 1979). The Court of Customs and Patent Appeals opinion in *Bergy* explained the importance of a flexible approach to determining the question of subject matter patentability, by framing the issue in the context of the "Anatomy of the Patent Statute."

The Court of Customs and Patent Appeals' explanation of this "statutory scheme," written by Judge Giles Rich, one of the drafters of the Patent

Act of 1952, used an analogy of "three doors" that must be passed through by inventors. *Bergy*, 596 F.2d at 960. Section 101 is the "first door," and inquires "what kind of invention or discovery" the inventor seeks to patent. Only if the invention "falls into any one of the named categories" is the inventor "allowed to pass through to the second door," novelty, and then through the "third door," non-obviousness. *Id.* at 960-961.[10] Although not mentioned by Judge Rich in *Bergy,* there is also a critical "fourth door" that must be included in this regard – Section 112 of the US patent statute, which has close analogies in the disclosure requirements of many other countries. Section 112 is principally composed of the enablement, written description, and indefiniteness tests, designed to dovetail with Section 101, to filter overbroad, unclear claims that are not so blatantly deficient as to cross over the broad "abstract" or "mathematical algorithm" or "law of nature" lines provided by Section 101. AIPPI respectfully submits that whatever deficiencies this

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[10] The underlying opinion in *In re Bergy*, at 596 F.2d 952, was actually affirmed by this Court under the caption *Diamond v. Chakrabarty*, 447 U.S. 303 (1980). The Commissioner of Patents and Trademarks sought certiorari of the *Bergy* decision, which this Court granted with respect to appeals concerning both Bergy and Chakrabarty, which were consolidated. 444 U.S. 924 (1979). Later, Bergy's appeal was dismissed as moot, 444 U.S. 1028 (1980), leaving only *Chakrabarty* as the case that was listed in this Court's opinion, which affirmed the C.C.P.A.

Court might find with the patents at bar under Section 101 could be rooted out with greater precision and much less collateral damage using Sections 102, 103, and 112.

AIPPI suggests that the statutory scheme of "doors" to be passed through, explained in the *Bergy* opinion of the Court of Customs and Patent Appeals, which is analogous to the "coarse filter" or first filter applied by the European Patent Office to the subject matter patentability question (described below), may be a useful analogy for this Court, as it ponders a standard for establishing how computer-implemented inventions should be evaluated by courts for subject-matter patentability under 35 U.S.C. § 101.

The *Chakrabarty* decision has been widely credited as being the foundation for the biotechnology industry, as well as investments in numerous medical therapies, technologies for increasing crop yields, and renewable fuels. In all of these fields the United States is now the unquestioned world's leader. This Court has an opportunity to make sure the United States maintains its leadership in computer-implemented technology as well, by ensuring that no rigid rule stifles innovation by limiting patentability in that field.

2. Other countries have developed flexible solutions for considering

patent eligibility of computer-implemented inventions.

This Court may find some useful analogies in the solutions that the other major patent systems around the world have used in their approach to the issue of subject matter eligibility of computer-implemented inventions. Like the United States, the European Patent Convention has a broad general statute for subject matter eligibility: "European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application." European Patent Convention of 1973, as amended, Art. 52, paragraph (1), *available at* http://documents.epo.org/projects/babylon/eponet.nsf/0/00E0CD7FD461C0D5C1257C060050C376/$File/EPC_15th_edition_2013.pdf (the "EPC"). But Article 52 paragraph 2 of the EPC expressly excludes certain things which "shall not be regarded as inventions," including "discoveries, scientific theories and mathematical theories," and "schemes, rules and methods for performing mental acts, playing games or doing business, and *programs for computers*" (emphasis supplied). Article 52, paragraph 3 of the EPC modifies the express exclusions of paragraph 2 somewhat, stating that "Paragraph 2 shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities *as such*" (emphasis supplied).

The use of the term "as such" in paragraph 3 has been interpreted to allow computer programs to be eligible subject matter for patents within the meaning of Article 52, paragraph (1) if the claimed invention "goes beyond the 'normal' physical interactions between the program (software) and the computer (hardware) on which it is run." Case T-1173/97, Computer Program Product/IBM, 1999 O.J. EPO 609, *available at* http://www.epo.org/law-practice/case-law-appeals/recent/t971173ex1.html.

According to the practice in Europe, an "invention" within the meaning of Article 52 paragraph 1 must have a "technical character." With respect to computer-implemented inventions, case law of the European Patent Office Boards of Appeal has gradually established several avenues for claimed inventions to meet the "technical character" requirement. A claimed invention can lie in the underlying problem, in the means (technical features) forming the solution to the underlying problem, in the effects achieved by solving the problem, or can be present if technical considerations (or technical knowledge) are required in order to realize a computer program. Case T-0468/03, Clipboard formats V/Microsoft, EPO (2006) (unreported), available at http://www.epo.org/law-practice/case-law-appeals/recent/t030468eu1.html (a method implemented in a computer system (e.g.

having a memory) has "technical character" and is thus an invention); Case T-0258/03, Auction Method/Hitachi, EPO (2004) (unreported), *available at* http://www.epo.org/law-practice/case-law-appeals/recent/t030258ep1.html (a method involving technical means is an invention within the meaning of Article 52, paragraph 1). Thus any claim for a computer-implemented invention that incorporates technical means in the claims, even if the technical means are commonly known, would likely be patentable subject matter in Europe if it is claimed in the form of an apparatus, a method, a program or a computer-readable storage medium.

During patent examination, as a preliminary step, the European Patent Office first assesses the claimed subject matter to determine whether there is the required technical character.[11] If so, the European Patent Office moves on to examine patentability under the other criteria of paragraph (1) of Article 52, whether the claimed invention is "new" and involves an "inventive step" (i.e., would the claimed invention have been non-obvious). The "inventive step" analysis for computer-implemented inventions also includes a "technical contribution" analysis. If the European Patent Office concludes that a computer-implemented invention does indeed demonstrate a "technical contribution," it is then deemed to be patentable.

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[11] This is what has sometimes been called a "coarse filter" or first filter for subject matter eligibility, before the finer filter for "technical contribution" is applied.

Under this approach, the European Patent Office has clarified the law of patentability for computer-implemented inventions. The issue of which categories of computer-implemented inventions will be eligible for patent protection is generally clear, and the focus of the European Patent Office and the courts has shifted to examining these sorts of inventions for their "technical contribution," rather than whether they are eligible for patent protection in the first instance.

Canada, like the United States, has a statute that defines patent eligible subject matter very broadly: "Invention' means any new and useful art, process, machine, manufacture or composition of matter, or any new and useful improvement in any art, process, machine, manufacture or composition of matter." Canadian Patent Act, R.S.C. 1985, c. P-4. And, as in the United States, this statute has historically been interpreted expansively, except that the Section 27 (8) of the Canadian patent statute expressly provides that "No patent shall be granted for any mere scientific principle or abstract theorem."

The issue of subject matter eligibility of computer-implemented inventions was most recently explicitly considered by Canada's Federal Court of Appeal in *Canada (Attorney General) v.*

Amazon.com, Inc., 2011 F.C.A. 328 (2011) (Can.). In that decision, the Federal Court of Appeal[12] endorsed the trial court decision holding that there is no stand-alone requirement for an invention to be scientific or technological in nature in order to be eligible subject matter. *Id.* at para. 56-58. Nor did the Federal Court of Appeal recognize any Canadian jurisprudence which stated conclusively that business methods cannot be patentable subject matter. *Id.* at paras. 59-63. And inventions relating to software and business methods, depending on the construction of the claimed inventions, may qualify as an "art" or "process" in the enumerated classes of inventions. *Id.* at para. 50. However, to determine whether or not such an invention qualifies as an "art" or "process," the court adopted the three-part test articulated by the Supreme Court of Canada in *Shell Oil Co. v. Commissioner of Patents*, 2 S.C.R. 536 (1982) (Can.):

> " .... i) it must not be a disembodied idea but have a method of practical application; ii) it

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[12] The Federal Court of Appeal is the intermediate appellate court. It has jurisdiction over appeals from the Federal Court, which has exclusive jurisdiction to hear and determine appeals from decisions of the Commissioner of Patents. The trial decision in the *Amazon.com* case resulted from an appeal of a Commissioner's decision. Decisions of the Federal Court and the Federal Court of Appeal are binding on the Canadian Patent Office. Decisions of the Federal Court of Appeal are subject to review by the Supreme Court of Canada.

> must be a new and inventive method of applying skill and knowledge; and iii) it must have a commercially useful result."

Id. at paras. 50-51.

The Federal Court of Appeal additionally held that "patentable subject matter must be something with physical existence, or something that manifests a discernible effect or change." *Amazon.com, Inc.*, 2011 F.C.A. 328 at para. 66. Thus in Canada, which has a statutory definition for patent-eligible subject matter that is very similar to that of the United States, the Federal Court of Appeal has concluded that it will require that a computer-implemented invention must either be something with physical existence, or something that manifests a discernible effect or change. In other words, the Canadian Federal Court of Appeal was articulating a test that is a somewhat more flexible version of the "machine or transformation" test advocated by the Federal Circuit before this Court's *Bilski* decision (but which does not seem to require a physical transformation or change, but rather just a "discernible effect or change"). Therefore Canada, like the European Patent Office, has attempted to accommodate computer-implemented inventions through a flexible standard for subject matter patentability.

Even the Japanese patent law, which is probably the least similar to the United States law, has evolved to allow flexibility in its interpretation to accommodate computer-implemented inventions. The Japanese patent statute defines statutory subject matter as the "highly advanced creation of *technical ideas* by which a *law of nature* is utilized." Tokkyohō [Patent Act], Law No. 121 of 1959, art. 2, para. 1 (Japan) (emphasis supplied). With respect to software related inventions, the Japan Patent Office interprets this to mean that if information processing by software is realized in a "concrete manner" using computer hardware resources and is claimed as such, then such a software-related invention is considered to be eligible subject matter. *See e.g.,* Japan Patent Office, Examination Guidelines for Patent and Utility Model in Japan, pt. 7, ch. 1 (Computer Software-Related Inventions), Sec. 2.2.2 at p. 11 (2013), *available at* http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/1312-002_e.htm. Further, for computer-implemented business methods, which themselves are not technical ideas, but rather economic ideas, patentability requires the business method to include a "technical" aspect, which the Japan Patent Office has interpreted to mean the business method must use computer hardware that provides "concrete means" in cooperation with software steps to implement the invention. *Id.* at Sec. 1.1 at 2-3; exs. 5-7 at 5-6. In other words, so long as it is explicitly made clear in a claim that a computer-implemented invention processes information by software in cooperation with hardware resources, or a business method is implemented as software steps that utilize, as claimed, hardware resources in a specific manner, a computer-implemented invention will be considered patent eligible subject matter in Japan. Notably, the Japanese patent claim drafting guidelines advise that "human intervention," such as an operator inputting an instruction to a computer, be clearly excluded from every step in a claim, in order to make the claimed inventions clear that it is hardware resources that are being used as the means for "concrete realization" of the invention. *Id.* at Sec. 2.2.2; exs. at 27-50.

V. CONCLUSION

The Federal Circuit's conflicting opinions concerning the patent-eligibility of computer-implemented inventions have sown confusion in the technology industry, domestically and abroad. The AIPPI, the world's leading international non-government organization for research into, and formulation of policy for, the law relating to the protection of intellectual property, respectfully encourages this Court to reaffirm the breadth of Section 101, and encourages this Court to use the opportunity presented by this case to set forth a flexible test that will allow for broad patent eligibility of computer-implemented inventions, and thus foster innovation in undeveloped, nascent, and yet to be discovered computer-implemented technologies, software, and business methods that are implemented using a computer.

Respectfully submitted,

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January 27, 2014

APPENDIX

APPENDIX

AIPPI Resolution Question 133
Patenting of Computer Software

Yearbook 1997/III, pages 299 - 303
Q133
Executive Committee of Vienna, April 18 22, 1997

Question Q133
Patenting of computer software

Resolution

AIPPI
considering its previous positions and resolutions adopted since 1974 recognising the need to protect creations embodied in computer software in general;
considering that copyright protection for computer software was initially recommended by AIPPI due to such type of protection being immediate and able to take benefit from already existing international conventions;

considering that copyright protection has been recognised by AIPPI as being inadequate as a sole system for protecting computer software;

considering the increasing technical and economic importance of computer software and the fact that effective protection for computer software developers is critical;

considering that the TRIPS Agreement requires patent protection without restriction for any inventions in all areas of technology; and

considering the **reasons** appended to this resolution, Resolves that:

1. As a question of principle clearly reflected in the TRIPS Agreement and taking into account other reasons of a legal, economic and practical nature, patents should be granted without discrimination in all areas of technology, including that of computer software, such as programmes.

2. Computer software should be considered patentable provided that the claimed subject matter meets the traditional patentability requirements of novelty, inventive step (non-obviousness) and utility or industrial applicability.

3. The technical character of computer software should be generally acknowledged and its industrial applicability should be construed in

a broad manner so as to embrace the concept of enabling a useful practical result.

4. In spite of increasingly liberal interpretations by the national and regional Patent Offices and Courts, modifications in many national and regional laws regarding patents are recommended to provide or ensure adequate patent protection for computer software; this including the abolition of any limitations in the laws or treaties relating to industrial property, as well as to promote legal certainty.

5. All computer software meeting the patentability requirements should be considered patentable in the same manner and with equality of treatment with no distinction being drawn between the different types of software.

6. Patent protection and copyright protection for computer software are of a different nature and relate to different aspects of the software. They may co-exist notwithstanding their different terms of protection.

7. Computer software should be inherently patentable in any medium in which it can be commercialised.

8. The establishment of special rules for different technologies is undesirable in general with respect to the presentation of the specification (description) and the drafting of the claims and the same principle should apply to patents relating to computer software, it being as usual the responsibility of the applicant to ensure that he meets the relevant national or international requirements. Moreover, special rules should not be encouraged as a solution to other problems, such as the difficulty to effect prior art searches. In this respect, AIPPI encourages all efforts by Patent Offices and all other interested parties to make prior art searches more reliable in the area of software without resorting to the adoption of special rules that could impose undue or unnecessary burden on patent applicants.

9. The concept of inventive step or non-obviousness should be applicable to the patentability of computer software, notwithstanding any practical difficulties that may exist.

10. The exercise of patent rights in the case of computer software is no different in principle from that in the case of other types of invention.

Reasons:

A) Principle of patentability

Independently of the terms of any specific national legislation, there is no doubt that the creation of computer software is of considerable technical complexity. In principle, therefore, there is no reason to deny patent protection to inventions in the area of computer software. Such a position is integrally in accordance with Article 27 of the TRIPS Agreement.

The creation of computer software is basically as lengthy and expensive a process as the software is simple to copy. A literal copy may be prohibited under copyright. However, the functional concept behind a given software may be copied without such an evident infringement of the copyright. Functional concepts translated into products or processes are the proper subject matter of patents and an efficient system of protection is highly desirable in order to protect investment and to encourage development in this particular technical area.

To exclude computer software from patent protection would be arbitrary and discriminative with respect to a technology of ever increasing importance and which merits concrete protection. In addition the dividing line between hardware and software is becoming increasingly blurred and it is discriminative to consider one patentable and the other not.

B) Conditions of patentability

If software is to be patentable, it is most appropriate that the same conditions apply as they do for other types of invention. Apart from novelty and inventive step (or non-obviousness), the law in most jurisdictions requires patentable inventions to have a technical character or technical applicability. Software can take many types of form, may be machine-integrated or not and new types of software will certainly appear with new technological development. It is therefore not appropriate to distinguish between the different types which should all be treated on an equal footing, the question of patentability depending on the invention meeting the traditional requirements.

With respect to technical or industrial character or applicability, basically all computer software is technical in nature and this alone should meet this requirement. However, it is important that some useful practical result be obtained. Moreover, the difference between a technical result and, for example an aesthetic result is not pertinent to the generally technical nature of the software in itself. In considering the patentability of any given software, therefore, any legal requirement regarding technical character should be construed broadly so as to embrace the concept of obtaining a useful practical result.

It should also be observed that the requirement of technical nature is open to many interpretations, as has been demonstrated by the many decisions on the matter. It is recommended that there only be a requirement for inventions to enable a useful practical result.

C) Legal Certainty and changes in legislation

The tendency of the courts in many countries that require inventions to have a technical character, including the European Patent Office, has become progressively less strict in construing the requirement as applied to software related inventions.

The laws of a large number of countries contain prohibitions to the patenting of software "per se". This is contrary to the TRIPS Agreement, contrary to the position given above and it is not useful.

Alterations in the relevant national and regional legislations, removing the software "per se" prohibition and eliminating the technical character requirement are therefore recommended to ensure the universal recognition of the patentability of computer software and to provide legal certainty.

It is emphasised that the removal of the software "per se" prohibition does not mean that all software is patentable. It only means that the mere fact that a claimed invention relates to software "per se" should not be a reason in itself for rejection. Naturally, it must fulfil the normal requirements of patentability,

D) The co-existence of patent and copyright protection

In spite of the difficulties that may arise

- in attempting to draw a line of demarcation between the aspects of computer software that can be protected under copyright and by means of a patent;
- with regard to the differences there may be between the proprietary rights under copyright and patent law; and
- with regard to the different durations of copyright and patent protection, especially with regard to problems that may arise in determining which aspects of the computer software cease to be protected when the patent rights expire,

there appears to be no decisive reason against the co-existence of patent and copyright protection. The apparent problem appears to be analogous to the difference between patents and models or registered designs which have historically existed side by side. Similarly, there appears to be no overriding reason why the expiry of a patent relating to software should have any effect on the protection under copyright that may continue to be in force.

E) Purely abstract data handling operations

The fact that a computer software invention involves merely abstract data handling operations should not exclude it from patentability, provided that it enables a useful practical result.

F) Software in machine-readable form

Considering that software in combination with a known general purpose computer may be patentable when a useful practical result is obtained, and furthermore that it is the software itself that represents the true technical and economic importance of the creation, it is arbitrary to consider the product that is commercialised to be excluded from protection. It would be the same thing as to say that a novel nut can only be patented when claimed in combination with its bolt or that a spark plug can only be claimed in combination with an internal combustion engine. Consequently, it is reasonable to consider computer software to be inherently patentable in any medium in which it can be commercialised, provided that it is novel and inventive and, furthermore, that when used appropriately, i.e. in combination with a computer, it produces a useful practical result.

G) The specification (description) and claims

It is a basic position of AIPPI that specific rules or norms for the drafting or presentation of the specification or claims of patents should be avoided wherever possible. There would appear to be no convincing reason for this to be different with respect to software inventions. The applicant for a patent should have the choice of presenting and claiming his invention as he thinks fit. Whether a patent does or does not meet the requirements of disclosure and patentability will always arise in the case of any technology and each applicant has to assume the responsibility of deciding how he meets the requirements. The meeting of very specific rules could well be an undue, unnecessary and possibly expensive burden on the applicant.

The only plausible reason for special rules for the presentation of the specification appears to be to facilitate prior art searches. However, this would not appear to justify the burden or the lack of liberty imposed on the applicant.

At the same time, AIPPI encourages Patent Offices and other interested parties to continue to make all efforts to devise manners, such as the development of classification systems and data-bases, to facilitate prior art searching.

H) The exercise of computer software patent rights

Notwithstanding the difficulties that may arise in the exercise of rights, in particular the questions of territoriality in the case of computer software used in international communications networks, no convincing reason has been found in principle for the exercise of software patent rights to be different from the exercise of patent rights in any other technical field. Exceptions to rights, such as with respect to interoperability (e.g. the communication between one software and another) are not approved, without prejudice to parallel laws or regulations that may already exist in other areas, including those relating to commercialisation, anti-trust and others.

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AIPPI Resolution Question 158
Patentability of Business Method[s]

Yearbook 2001/II, pages 243 - 244
Q158
38th Congress of Melbourne, March 23 30, 2001

Question Q158
Patentability of Business Methods

Resolution

AIPPI

Considering that:

(a) The patent system is designed to compensate fairly research as well as the creation of new inventions.

(b) The right to protect inventions arising out of economic activities is guaranteed by article 1 of the Paris Convention.

(c) Pursuant to article 27 of the TRIPS treaty, a patent may be obtained for any invention in all fields of technology.

(d) The question of protection of business methods has been raised due to the widespread use of computers and the development of software.

(e) During the 1997 meeting of the Executive Committee held in Vienna, which considered Question 133 "The Patentability of Computer Software" the AIPPI formally declared it was in favour of patent protection of computer software.

And whereas:

(f) Since its origins, patent law has progressively adapted to new subject matter,

(g) Problems resulting from this expansion have nevertheless been resolved without the necessity of substantially modifying the criteria for the granting of patents,

(h) Creations of a purely abstract nature are generally excluded from the scope of protection of patents,

(i) In several legal systems, inventions, in order to be protected by patents, must not only be useful but must also possess a technical content,

(j) The TRIPS treaty has not specified how it intends the term "fields of technology" appearing in article 27 to be defined with respect to the definition of patentable subject matter,

(k) The expansion of patentable subject matter, which has not yet been considered by different national laws may raise practical problems, particularly with respect to procedures and rules of examination before patent offices.

Adopts the following resolution:

1 Inventions including methods used in all fields of industrial, commercial and financial activities, herein referred to for purposes of simplification as "business methods", should be entitled to patent protection provided that the invention as defined in the claims has a technical content,

2 If such an invention as a whole has a technical content, that should be sufficient for patentability even though the point of novelty and inventive step (non-obviousness) does not lie in the technical content.

3 Further, the protection of such inventions by patents should be assessed or based upon the same criteria as other inventions, and no new or special criteria should be applied,

4 The assessment of inventive step for such inventions should be made on a case-by-case

basis and even known methods may, if their application to a new field is inventive, be granted patent protection.

5 Merely transforming a known method into software form does not give rise to a presumption that such an invention has an inventive step.

6 Patents for business methods should be treated in the same way as patents in other fields. In particular:

a. The scope of protection granted by patents with respect to business methods should be the same as the protection granted to other inventions.

b. Where evidentiary methods allow for a reversal of the burden of proof, this should be available for business method patents as well.

c. The term for such patents should be the same as for patents in other fields.

d. The remedies for infringement of such patents, such as damages and injunctions, should be the same as for patents in other fields.

7 In the granting of such patents, AIPPI encourages the improvement of search and examination procedures by patent offices, particularly by the creation of databases in connection with prior art.

AMICUS
CURIAE
BRIEF

RECORD
AND
BRIEFS

Supreme Court, U.S.
FILED
JAN 28 2014
OFFICE OF THE CLERK

No. 13-298

In the
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL
AND CLS SERVICES LTD.,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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CORPORATE DISCLOSURE STATEMENT

Amicus curiae states that it does not have any parent corporation and that no publicly held company owns more than 10% of its stock.

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STATEMENT OF INTEREST[1]

International Business Machines Corporation (IBM) is a globally recognized leader in the field of information technology research, development, design, manufacturing, and related services. During IBM's more than 100-year history, its employees have included five Nobel laureates, five National Medal of Science recipients, and ten winners of the National Medal of Technology. IBM has been a leader in developing breakthrough software innovations, including the relational database, the FORTRAN programming language, and the virtual machine. The United States Patent and Trademark Office (PTO) has granted IBM tens of thousands of United States patents; more patents each year than any other entity for the last 21 years.[2] Accordingly, IBM has long served as a leading advocate for sound patent policy.

In light of its sizeable patent portfolio and diverse business interests, IBM can provide a balanced view of patent eligibility standards—particularly as they relate to the patenting of computer-implemented inventions such as those implemented in software. As a leading recipient, licensee, and licensor of patents, IBM has a compelling interest in the development of clear and consistent rules governing patent eligibility and is committed to maintaining both the integrity of the United States patent laws and the quality of patents themselves. IBM has frequently been involved in patent litigation, both as a patentee seeking to enforce its patent rights and as an accused infringer defending itself against others' claims. As a major force in the information technology industry, IBM has firsthand knowledge of the critical role the patent laws have played over the last few decades in protecting software investments and information technology research and development.

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[1] Pursuant to Supreme Court Rule 37.6, *amicus curiae* states that no counsel for any party authored this brief in whole or in part and that no entity or person, aside from *amicus curiae* and its counsel, made any monetary contribution toward the preparation or submission of this brief. Pursuant to Supreme Court Rule 37.3, counsel of record for all parties have consented to this filing in letters on file with the Clerk's office.

[2] *See, e.g.*, Press Release, IFI Claims Announces Top U.S. Patent Assignees of 2013 (Jan. 13, 2014), http://bit.ly/1f9qR4q ("IBM is at the top of the list again with a record-setting 6,809 patents, continuing a dominance that has lasted 21 straight years.").

INTRODUCTION AND SUMMARY OF ARGUMENT

Software is not a new technology. It has been around in various forms for well over half a century. During that time, it has become one of the fundamental building blocks of innovation and technological advancement, and a critical part of our Nation's economy. Software is the medium for innovation in every field, from automobiles to manufacturing to medicine. The fact that the Court is now—in 2014—actively considering such a basic question as whether computer-implemented inventions such as software are even eligible for patent protection is deeply troubling.

This Court's felt need to review whether computer-implemented inventions such as software are patent-eligible is an unmistakable indicator that § 101 jurisprudence in this area has proven unworkable. This Court has repeatedly grappled with

§ 101 and the judicially-created exceptions to that provision: "laws of nature, natural phenomena, and abstract ideas." *Diamond v. Diehr*, 450 U.S. 175, 185 (1981). With respect to this last exception—abstract ideas—despite the Court's best efforts, not to mention those of IBM and others that saw promise in § 101's ability to weed out problematic patents, a workable test for when a computer-implemented invention is a patent-ineligible abstract idea has not emerged.

There should be no serious question that computer-implemented inventions such as software constitute patent-eligible subject matter under § 101. Courts and amici agree that the technological functions carried out via software could also be implemented through computer hardware in the form of integrated circuits (chips) or other discrete electronic components, and the patent eligibility of those tangible devices is beyond question. Accordingly, there is no principled reason to draw distinctions between hardware and software when it comes to § 101 patent eligibility. Still, arguments that computer-implemented inventions such as software are not patent eligible persist and are proffered with increasing frequency as computer-implemented inventions become more pervasive and as innovative software brings computer implementation within the ken of many ordinary computer users.

Questions concerning the patent eligibility of even the most technologically innovative software are being raised as a consequence of the unworkability of the abstract idea doctrine as applied to computer-implemented inventions. Drawing on this Court's case law, courts and commentators have repeatedly expressed concern that a patentee can "preempt" an entire field or fundamental idea by claiming the implementation of a well-worn concept on a computer. *See Diehr*, 450 U.S. at 187 ("Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation."); *Parker v. Flook*, 437 U.S. 584, 589 (1978) (expressing concerns with claims that would "'wholly preempt'" a field); *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972) ("[I]f the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself."); *see also Bilski v. Kappos*, 130 S. Ct. 3218, 3231 (2010) (concluding that the disputed claims "would pre-empt [risk hedging] in all fields, and would effectively grant a monopoly over an abstract idea"). In many cases, courts appear to have adopted the view that implementation on a computer has become so commonplace as to be technologically meaningless and that, as a result, a patentee claiming the implementation of an abstract idea on a computer is claiming nothing more than the abstract idea itself.

While it may be true that the steps required to implement an abstract idea on a computer are well established and thus likely within the capability of one skilled in the art, the implementation of that idea on a computer, however minimal the effort, definitively separates that specific technological implementation from the idea itself. Technology has enabled an astounding diminishment of the man-machine interface, but it has not erased the need for that interface and, as a result, even the most problematic computer-implemented invention will be meaningfully different from and narrower than the associated abstract idea. Thus, computer-implemented inventions will always fall outside the abstract idea exception and are patent eligible under § 101.

To be sure, patents that do no more than implement an otherwise abstract idea on a computer through conventional programming raise concerns reminiscent of those identified in this Court's § 101 jurisprudence, and such patents are part and parcel of a larger challenge facing our Nation's patent system. Patentees have all too often obtained patent protection for very straightforward ideas by simply stating in their patent application that the idea will be executed in a specific technological medium. *See, e.g.*, *Bilski*, 130 S. Ct. at 3230 (the "prohibition against patenting abstract ideas 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment'" (quoting *Diehr*, 450 U.S. at 191-92)). And patentees have repeatedly been able to secure overbroad patents that threaten to undermine innovation. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1303 (2012) (discussing concerns with foreclosing future innovation).

But as IBM's day-to-day real-world experience has repeatedly confirmed, a muscular application of the abstract idea doctrine is not a useful tool for addressing these problems in the computer-implemented invention context. As this Court has recognized, "all inventions at some level embody" an abstract idea. *Mayo*, 132 S. Ct. at 1293. And unlike laws of nature and natural phenomena, abstract ideas defy the demarcation of meaningful boundaries that make the development of clear and administrable rules possible. As a result, efforts to apply the abstract idea doctrine to computer-implemented inventions quickly devolve into an undisciplined parsing and rewriting of the relevant claims such that courts end up evaluating a claim of their own making—not what the inventor actually claimed. *See* 35 U.S.C. § 112(b) (the "*inventor*" must "particularly point[] out and distinctly claim[] the subject matter which" he "regards as the invention" (emphasis added)). Moreover, the unwieldy nature of the abstract idea doctrine makes it impossible to apply that doctrine to computer-implemented inventions as a "threshold test." *Bilski*, 130 S. Ct. at 3225. Every patent implements some abstract idea and attempting to isolate and assess the extent to which a computer-implemented invention "preempts" or "monopolizes" an abstract idea will always require more than the quick look that § 101 contemplates.

While the prospect of preempting abstract concepts through their implementation on a computer understandably leads courts to ask § 101-type questions, the answer to this § 101-type concern actually lies in § 103's bar on obvious patents. The very same innovations that have eroded the man-machine interface and made programming a much more accessible feat than it once was have also made it far more likely that the computer implementation of an idea would be readily within the grasp of skilled programmers and thus obvious.

In addition to avoiding the pitfalls of applying the abstract idea doctrine in an area where it is has proved unworkable, focusing on obviousness when evaluating computer-implemented inventions has much to recommend it. The test for whether a patent is invalid for obviousness under § 103 is clear and easy to apply. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 402, 406 (2007). First, courts and patent examiners must determine the scope and content of the relevant prior art. Second, the level of skill of the ordinary artisan must be identified. Third, the scope and content of the claimed invention must be defined through the process of claim construction. *See KSR*, 550 U.S. at 406. And finally, with that information in hand, courts must determine whether § 103's requirements have been met.

The prior art analysis required under § 103 entails construing and evaluating the actual claim and each claim element, thus ensuring a focused inquiry into the actual invention at issue (as opposed to an unjustified parsing and effective rewriting of the claims). Relatedly, while continually evaluating patents under § 101 does nothing to combat problems with broadly drafted patents, further developing § 103 doctrine can play a critical role in increasing patent quality and can also assist in keeping any inquiry into "inventiveness" where it belongs. And perhaps most importantly, the more fine-grained analysis that § 103 mandates ensures that the patent-eligibility of broad swaths of technology will not be called into question, fostering the certainty that investment in innovation demands.

ARGUMENT

I. The Substantial Uncertainty Regarding The Patent-Eligibility Of Computer-Implemented Inventions Endangers A Critical Part Of Our Nation's Economy And Threatens Innovation.

Software—the computer-readable code embodying functionality in virtually every modern system or device—plays a vital role in our everyday lives. It provides the means by which computers run word processing programs, enables e-mail communication and Web browsing, allows cellphones to connect to wireless networks, aids air traffic controllers in safely scheduling the arrival and departure of flights, and permits physicians to diagnose and treat illnesses. "[S]oftware implemented innovations power our modern world, at levels of efficiency and performance unthinkable even just a few years ago," and "patent protection is every bit as well-deserved for software-implemented innovation as for the innovations that enabled man to fly, and before that for the innovations that enabled man to light the dark with electricity, and before that for the innovations that enabled the industrial revolution." David J. Kappos, Under Sec'y of Commerce for Intellectual Prop., Keynote Address at the Ctr. for Am. Progress: An Examination of Software Patents (Nov. 20, 2012), http://1.usa.gov/1cZCeaj ("Kappos Nov. 2012 Speech").

More than this, software plays a crucial role in our Nation's economy. The world's most innovative and productive software companies are all U.S. companies. In 2009, the software industry added over $276 billion to the U.S. economy. *See, e.g.*, OECD STAN Database for Structural Analysis, http://bit.ly/1egQzAh. In 2010, consumers and businesses in the United States invested over $257 billion in new or replacement software. Bureau of Econ. Analysis, *Private Fixed Investment in Equipment & Software* 7, http://1.usa.gov/1f9vYBI. United States software exports generate more than $20 billion in revenue annually. Econ. & Statistics Admin. & U.S. Patent & Trademark Office, *Intellectual Property and the U.S. Economy: Industries in Focus* 55 (2012), http://1.usa.gov/1jqp5j1 ("2012 PTO Report"). And the software industry's innovative impact is multiplied many times over by the fact that downstream businesses benefit from and capitalize on software innovation. *Id.* at ii (describing the "domino effect" of innovation in the software industry).

The software and information technology industries are also a constant bright spot in an economy that continues to struggle to create jobs. In 2006, the industries employed more than 2.7 million Americans, adding 400,000 jobs between 1997 and 2006. Software & Info. Indus. Ass'n, *Software & Information Driving the Global Knowledge Economy* 8 (2008). That marked growth is in sharp contrast to other industries' declines—job creation in the transportation equipment manufacturing and chemical manufacturing sectors, for example, declined by 13% during this time period. *Id.* And the U.S. Department of Labor projects that the software labor market will continue to be among the fastest growing through at least 2016. U.S. Dep't of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook* 9 (2008).

The current uncertainty regarding the patent eligibility of computer-implemented inventions such as software puts all this at risk. Clarity and predictability in the patent law are imperative. *See Bilski*, 130 S. Ct. at 3231 (Stevens, J., concurring) ("In the area of patents, it is especially important that the law remain stable and clear."). That is because ambiguity in the rules governing patents breeds uncertainty discouraging investment in the research and development necessary to create new and useful technologies. *See, e.g.*, Kappos Nov. 2012 Speech, *supra* (describing how "uncertainty" in the patent law "stifle[s] innovation").

And while certainty in the patent law is important as a general matter, it is absolutely critical in the technology sector. Firms operating in that sector spend billions of dollars on research and development aimed at bringing new products to market. "[I]n order to invest the necessary resources," companies "need some assurance that they will benefit from and recover the costs of the creation of intellectual property." 2012 PTO Report at 1.[3]

IBM is a case in point. Of the approximately $6 billion IBM invests annually in research and development, approximately half, or $3 billion, is directed to software innovation. And IBM is continually expanding its research and development in new and exciting ways. Earlier this year, for example, IBM announced the formation of a new business unit—the IBM Watson Group—heralding the dawn of a new era of cognitive computing. At the core of this new era of computing are software, services, and applications that think, learn, and discover insights by metabolizing massive amounts of data. *See* Press Release, IBM Forms New Watson Group to Meet Growing Demand for Cognitive Innovations (Jan. 9, 2014), http://ibm.co/LZt6NC. IBM relies on patents to help protect such creative endeavors. Clear rules governing patent eligibility and patentability thus yield real and tangible benefits, not just to innovative firms, but to the consumers that ultimately benefit from the creation of innovative products.[4]

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[3] Calling the patent eligibility of computer-implemented inventions such as software into question sends a signal that is likely to encourage certain foreign governments to redouble their efforts to marginalize U.S. software intellectual property rights, or to take advantage of a gaping hole in the U.S. patent system to lure investment away from the U.S. *See* Keith E. Maskus, *Intellectual Property Rights in the Global Economy* 143-70 (2000) (explaining how strong and comprehensive intellectual property regimes attract investment).

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[4] Lest there be any doubt, software innovations are not adequately protected by copyright law, which only protects the specific "expression" of a software program—not the high level functionality implemented in software products. This is true as both a matter of text and precedent. The Copyright Act provides that "copyright protection" does not "extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work." 17 U.S.C. § 102(b). And courts have long recognized that copyright law cannot be invoked to protect the functional aspects of software. *See, e.g., Lotus Dev. Corp. v. Borland Int'l, Inc.*, 49 F.3d 807 (1st Cir. 1995) (holding that the menu command hierarchy of a computer spreadsheet program was "uncopyrightable"), *aff'd per curiam by an equally divided Court*, 516 U.S. 233 (1996).

II. The Patent Eligibility Of Computer-Implemented Inventions Should Be Beyond Dispute.

There should be no debate that computer-implemented inventions such as software are eligible for patent protection. But, as the Federal Circuit's deeply divided en banc opinion in this case abundantly demonstrates, the abstract idea exception has proven extremely difficult to apply to computer-implemented inventions and has created substantial uncertainty in an area where clear and administrable rules are imperative.

A. The Abstract Idea Doctrine Is Unworkable in the Computer-Implemented Invention Context.

Courts and commentators alike have repeatedly noted the elusive nature of the abstract idea doctrine. *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1277 (Fed. Cir. 2013) ("[D]eciding whether or not a particular claim is abstract can feel subjective and unsystematic, and the debate often trends toward the metaphysical, littered with unhelpful analogies and generalizations."); *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1259 (Fed. Cir. 2012) ("When it comes to explaining what is to be understood by 'abstract ideas' in terms that are something less than abstract, courts have been less successful."); Donald S. Chisum, *Weeds and Seeds in the Supreme Court's Business Method Patents Decision: New Directions for Regulating Patent Scope*, 15 Lewis & Clark L. Rev. 11, 14 (2011) (The "abstract idea preemption inquiry can lead to subjectively-derived, arbitrary and unpredictable results. This uncertainty does substantial harm to the effective operation of the patent system."). And that general problem is particularly pronounced in the computer-implemented invention context. Many functions that were traditionally performed in the mechanical or analog world can now be discharged digitally in the virtual world far more efficiently, which is why software is the medium of choice for both implementation and innovation. *See* Marc Andreessen, *Why Software Is Eating The World*, Wall St. J. (Aug. 20, 2011), http://on.wsj.com/1aD0OUh. The availability of patent protection has stimulated innovations that have unlocked the potential of computers through both hardware and software. Given the unquestioned patent eligibility of hardware, there really should be no question regarding the patent eligibility of software. And yet that question persists, and, if anything, has become more prevalent with time as software has become the dominant means for imparting function to all types of machines.

Precisely because computers unlock new fields for innovation, there is a need to distinguish between efforts to occupy a field by simply taking a well-known abstract idea and articulating a few generic steps to implement it on a computer, and true innovations that unlock the potential of computers. And because concerns with preempting an entire field are often associated with § 101, *see Bilski*, 130 S. Ct. at 3231, there is an understandable impulse to treat the implementation of an abstract idea on a computer as no different from the abstract idea itself.

That view is irreconcilable with the "wide scope" of § 101 and its aim of providing "expansive" coverage to the fruits of invention, *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980), the narrow dimensions of the judicially-created exceptions to patent-eligibility, and the nature of implementing ideas on a computer. Even if the steps to implement an idea are well within the capability of "a person having ordinary skill in the art," 35 U.S.C. § 103, it remains true that implementation on a computer is an application on a machine; it is not an amorphous idea or a creation of the mind. Accordingly, while the concept of an abstract idea implemented conventionally on a computer raises issues reminiscent of this Court's concerns regarding "preemption" and excess "monopolization," *see Bilski*, 130 S. Ct. at 3231; *Mayo*, 132 S. Ct. 1293, computer-implemented inventions are more than the abstract idea itself and are ill-suited for evaluation under the abstract idea rubric.

B. The Fractured Opinion Below Demonstrates the Futility of Attempting to Apply the Abstract Idea Doctrine to Computer-Implemented Inventions.

The Federal Circuit's varied attempts to apply abstract idea precedent in this case demonstrate the doctrine's failure in the computer-implemented invention context. Looking to "guideposts" he identified in this Court's precedents, Judge Lourie derived a four-step test for assessing whether an invention falls within the abstract idea exception. A court should begin by determining "whether the claimed invention fits within one of the four statutory classes set out in § 101," 717 F.3d at 1282—*viz.* whether the claim is to a "process, machine, manufacture, or composition of matter," § 101. If the claim is to one of these statutory classes, the court must next assess whether any abstract idea is implicated by the claimed invention. 717 F.3d at 1282. To the extent the invention implicates an abstract idea, the court should then "identify" whatever "fundamental concept appears wrapped up in the claim"—"one cannot meaningfully evaluate whether a claim preempts an abstract idea until the idea supposedly at risk of preemption has been unambiguously identified." *Id.* Finally, the "inquiry ... proceeds to the requisite preemption analysis," which requires an evaluation of whether a claim "contains additional substantive limitations that narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself." *Id.*

Chief Judge Rader took a different approach. Noting § 101's expansiveness, the Chief Judge concluded that in determining whether a claim falls under the abstract idea exception, the relevant inquiry is whether the claim "includes *meaningful* limitations restricting it to an application." 717 F.3d at 1299. Whether such a limitation is sufficiently meaningful for computer-implemented invention claims turns on "whether the claims tie the otherwise abstract idea to a *specific way* of doing something with a computer, or a *specific computer* for doing something; if so, they likely will be patent eligible." *Id.* at 1302.[5]

As a brief review of only two of the five opinions in this case makes plain, courts cannot develop a single reliable test for the abstract idea exception when it comes to computer-implemented inventions. And the struggle evident in this case is merely the most recent example of the turmoil this doctrine has caused the courts, the PTO, and—most critically—innovators for decades.[6] The blame for that failure does not fall on the Federal Circuit alone. The "guideposts" developed by this Court over the years, and supported through recommendations by well-intended amici such as IBM, *see, e.g.*, Brief for Amicus Curiae International Business Machines Corporation, *Bilski*, 130 S. Ct. 3218, 2009 WL 2418481, at *5 (2009) (encouraging the Court to adopt a "technological contribution" test for patent eligibility), have after decades of struggling failed to yield a formulation of the abstract idea exception that can be administered to computer-implemented inventions with any degree of predictability.

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[5] The different approaches endorsed by Chief Judge Rader and Judge Lourie yielded different conclusions regarding the patent eligibility of the apparatus claims at issue.

C. Real-World Experience Confirms That the Abstract Idea Doctrine Is Ill-Suited for Application to Computer-Implemented Inventions.

Based on its day-to-day real-world experience, IBM has concluded that the abstract idea doctrine's failure is not due to the elusiveness of the proper test, but rather because the doctrine should not be applied to computer-implemented inventions. IBM, like this Court, has grave concerns about non-innovative patents that crowd out true innovation by occupying entire fields of computer innovation without actually advancing the use of computers in practical terms. And IBM, like this Court, initially believed that a § 101 abstract idea test could be formulated to address concerns about preemption. But real-world experience has convinced IBM that while the abstract idea concept helps identify a serious problem, it does not provide a workable solution to the problem. Unlike this Court, which wrestles with the abstract idea doctrine episodically (albeit with increasing frequency), IBM wrestles with that doctrine on a daily basis in the context of the questioned patent-eligibility of sophisticated software that goes well beyond efforts to perform a known function using a computer. Indeed, allegations that computer-implemented inventions such as software are, in fact, patent-ineligible are now legion. *Cf. MySpace*, 672 F.3d at 1261 (discussing the possibility that a § 101 challenge will become a "toss-in for every defendant's response to a patent infringement suit"). That is because the malleability of the abstract idea concept casts the patent eligibility of even highly innovative and sophisticated inventions into doubt.

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[6] *See, e.g.*, *In re Iwahashi*, 888 F.2d 1370 (Fed. Cir. 1989) (applying the Freeman-Walter-Abele test, which provided that an algorithm was patent eligible only if it is employed in a physical process or machine); *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc) (applying the "useful, concrete, and tangible result" test); *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008), *aff'd but criticized sub nom. Bilski v. Kappos*, 130 S. Ct. 3218 (2010) (applying the "machine or transformation" test).

The highly innovative and enormously valuable invention of public key cryptography, the inventors of which have been inducted into the National Inventors Hall of Fame, provides an example. *See* U.S. Patent No. 4,200,770. The advent of the internet and electronic communication over public channels presented a challenge for secure communications, since public lines are easily susceptible to eavesdropping. The breakthrough invention of public key cryptography elegantly solved this problem, enabling secure communication over public computer networks. The innovation requires only that two communicating parties maintain their own individual secret private keys. These private keys are used to create public keys that cannot be reverse engineered. The public keys can thus be exchanged over public networks and used to generate secure ciphers for decrypting messages without ever transmitting the private key between the communicating parties. The solution is particularly valuable because the computational requirements to create these keys and ciphers can be readily implemented via conventional programming techniques.

Without the patented invention of public key cryptography, the secure communication needed to enable modern electronic commerce would not exist. And yet, this groundbreaking invention is vulnerable to a finding of patent ineligibility under current abstract idea jurisprudence. Cryptography—"the science or study of the techniques of secret writing, especially code and cipher systems, methods, and the like," *Webster's Unabridged Dictionary* 485 (2d ed. 2001)—has existed for thousands of years as a means for people to privately communicate over a distance. *See, e.g.*, Simon Singh, *The Code Book: The Science of Secrecy from Ancient Egypt to Quantum Cryptography* (1999) (describing the history of cryptography). For example, Julius Caesar used cryptography to encode messages sent to his fellow generals during the Gallic Wars. *See id.* at 9-11. And when Benjamin Franklin sought to enlist French scholar Charles Dumas as an

American agent during the Revolutionary War, they communicated using a numeric cipher. *See* Edmund C. Burnett, *Ciphers of the Revolutionary Period*, 22 Am. Hist. Rev. 330-31 (1917). As a result, the crucial innovation of public key cryptography could be characterized as nothing more than a conventional computerization of the ancient and "abstract idea" of encryption, rendering it patent ineligible.[7]

D. The Amorphousness of Abstract Ideas, Their Substantial Difference From § 101's Other Exceptions, and § 101's Status as a Threshold Test All Help Explain the Doctrine's Failure as Applied to Computer-Implemented Inventions.

There are several reasons for the abstract idea doctrine's failure to yield an administrable test in the computer-implemented invention context. As an initial matter, as this Court has recognized, "all inventions at some level embody, use, reflect, rest upon or apply ... abstract ideas." *Mayo*, 132 S. Ct. at 1293. "Any claim can be stripped down, simplified, generalized, or paraphrased to remove all of its concrete limitations, until at its core, something that could be characterized as an abstract idea is revealed." *CLS*, 717 F.3d at 1298. As a result, anytime a court begins its analysis by looking for an abstract idea, it is surely going to find one. But pursuing that approach to its logical end would "eviscerate patent law." *Mayo*, 132 S. Ct. at 1293.

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[7] Public key cryptography is not unique in this respect. Scores of highly innovative inventions, including countless other inventions by innovators who have been inducted into the National Inventors Hall of Fame, would be vulnerable under the current view of the abstract idea doctrine. *See, e.g.*, U.S. Patent No. 2,612,994 (optical scanners that read bar codes); U.S. Patent No. 5,572,218 (the technology enabling GPS location).

Relatedly, the abstract idea exception is fundamentally different from the other judicially-created exceptions to patent eligibility. Unlike laws of nature and natural phenomena, which exist in nature and are discovered, abstract ideas do not exist in nature and are instead created. Consequently, abstract ideas have no core of clearly verboten subject matter. Laws of nature and natural phenomena have boundaries capable of clear delineation. A court might be able to assess in an administrable and workable way whether a patentee attempts to claim "the heat of the sun, electricity, or the qualities of metals," *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948), "a new mineral discovered in the earth or a new plant found in the wild," "the law of gravity," or "$E=mc^2$," *Chakrabarty,* 447 U.S. at 309. But abstract ideas lack clear lines of demarcation and thus force line-drawing that re-writes the claim in unpredictable ways never contemplated by the inventor, turning on a subjective inquiry that makes the development of the type of clear rules on which innovation depends impossible.

The end result is that any application of the abstract idea exception involves an undisciplined parsing and rewriting of the claims such that the court's ultimate analysis of the patent eligibility of an invention turns on the assessment of something that bears little-to-no resemblance to what is actually claimed.[8] That fatally flawed enterprise quickly devolves into a subjective and free-floating inquiry that defies predictable results. Allowing courts to rule based on subjective intuitions might work in some areas of the law, but patent law is not one of them. *See Bilski*, 130 S. Ct. at 3231 (Stevens, J., concurring) ("In the area of patents, it is especially important that the law remain stable and clear.").

The problems with the application of the abstract idea doctrine are exacerbated further by § 101's function as a "threshold test." *Bilski*, 130 S. Ct. at 3225. Section 101 is supposed to serve as a "coarse" filter, with the other more specific and demanding aspects of Title 35 doing the real work of sorting the wheat from the chaff. In other words, § 101 should operate as a quick look that ensures that patents are directed to a process, machine, manufacture, or composition of matter, and do not claim to monopolize the basic building blocks of innovation. *See, e.g.*, *Chakrabarty*, 447 U.S. at 309. Inventions implementing laws of nature and natural phenomena are amenable to this coarse filter, but computer-implemented inventions—which may implement abstract ideas—are not. As a result, the abstract idea doctrine has often been used as an ill-fitting proxy for analysis of the other Title 35 inquiries that themselves tend to weed out efforts to patent the types of well-known abstract ideas the courts are struggling with.[9]

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[8] *See, e.g.*, *CLS Bank Int'l v. Alice Corp. Pty*, 717 F.3d 1269, 1286 (Fed. Cir. 2013) (recasting the claim as nothing more than "the idea of third-party intermediation"); *CLS Bank Int'l v. Alice Corp. Pty.*, 685 F.3d 1341, 1357 (Fed. Cir. 2012) (Prost, J., dissenting) (recasting the claim as nothing more than the ancient idea of "'credit intermediation'"); *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) (recasting the claims as "'the use of the abstract idea of [managing a stable value protected life insurance policy]'"); *Ultramercial, LLC v. Hulu, LLC*, No. CV 09-06918 RGK, 2010 WL 3360098, at *6 (C.D. Cal. Aug. 13. 2010) (recasting an eleven step claim as the abstract idea of using "advertisement as an exchange or currency") *rev'd*, 657 F.3d 1323 (Fed. Cir. 2011); *cf. Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1350 (Fed. Cir. 2013) ("The claim does not cover the use of advertising as currency disassociated with any specific application of that activity. It was error for the district court to strip away these limitations and instead imagine some 'core' of the invention.").

In the absence of a doctrinal change in direction, the problems with the abstract idea doctrine will only get worse. "[T]imes change" and "[t]echnology and other innovations progress in unexpected ways." *Bilski*, 130 S. Ct. at 3227. Section 101 is a "dynamic provision designed to encompass new and unforeseen inventions." *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred*

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[9] In *Mayo*, this Court addressed the problem of potential "overlap" between § 101 issues and those raised under other sections, such as § 102 and § 103. As discussed above, this overlap expresses itself in the difficulty lower courts have had in applying the abstract idea exception to computer-implemented inventions, and their reliance on novelty and obviousness analysis, such that § 101 no longer operates as the coarse filter it is meant to be. By contrast, IBM submits that computer-implemented inventions such as software will always be patent-eligible under § 101, and that the concerns this Court has addressed regarding preemption and excess monopolization can be ably and properly addressed in the computer-implemented invention context through application of § 103 specifically. *See infra*. Moreover, an important concern this Court expressed with looking beyond § 101 in *Mayo* is inapplicable—unlike natural laws and phenomena, abstract ideas may appropriately be considered as part of the prior art. *See* 132 S. Ct. at 1304.

Int'l, Inc., 534 U.S. 124, 135 (2001). Indeed, in a patent system that functions as Congress intended, the creation of new and innovative technologies would be encouraged. But the development of emerging technologies requires innovators to take substantial financial and technological risks, making the certainty of patent eligibility in such technologies all the more imperative. The current regime foreshadows that each emerging technology will be forced to deal with repeated attacks and defend the patent eligibility of its innovations against allegations that those innovations fall within the ever-broadening abstract ideas exception. Worse still, the current skepticism regarding the patent eligibility of computer-implemented inventions—even highly innovative ones—suggests that each time a new technology reaches a certain threshold of ubiquity, the appropriateness of providing patent protection for that technology will be called into question despite the fact that it is the protection the patent system provides that allowed the technology to advance to that point in the first place.[10]

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[10] None of the foregoing is meant to suggest that this Court should adopt and endorse some sort of field-specific patent-eligibility test for computer-implemented inventions such as software. A field-specific test along those lines would conflict with the plain text of § 101, which makes no distinction between various technological fields, and this Court's general application of the laws of nature, natural phenomena, and abstract idea exceptions. Rather, IBM's view is that, while many of the computer-implemented inventions that the Court may find troubling are likely unpatentable under § 103, *see infra* pp. 26-32, those inventions will always constitute patent-eligible subject matter under the generally applicable § 101 test. *See Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir.

The rapid evolution of computer technology illustrates this concern. Incentives provided by the patent system have helped turn computers from room-sized behemoths used only by scientists to ubiquitous hand-held devices that can be used for all manner of complex activities. This astonishing progression, however, has led courts to ignore the fact that scores of enormously innovative and highly valuable inventions were necessary to accomplish this transformation and erode the barrier between man and machine. In allowing this more intuitive interface to obscure the presence of the machine in patent eligibility analysis, courts are effectively declaring the erosion of the interface complete. That declaration threatens the development of further interface-eroding innovations that promise a new era where computers will be able to think more like humans. "Cognitive computing" systems will closely emulate human thought processes and be able to learn and deliver insight based on their accumulated knowledge. *See, e.g.*, Cognitive Computing, http://ibm.co/1l5Ud9e. Adopting an abstract idea test that ascribes no weight to the presence of a computer at this critical time endangers this technology before it even leaves the starting gate.

2010) ("[I]nventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory language and framework of the Patent Act."); *see also Chakrabarty*, 447 U.S. at 308 (noting the "wide scope" and "expansive" coverage of § 101).

III. Many Of The Concerns This Court Has Addressed In Its § 101 Abstract Idea Precedents Would Be Better Addressed Under § 103.

This Court's abstract idea case law has identified a problematic class of patents, some of which involve computer-implemented inventions, that invoke concerns associated with § 101 and preemption. While further development of the abstract idea concept in this area is not the solution, § 101 itself provides the answer. That section explains that in addition to being patent eligible, a claimed invention must also satisfy "the conditions and requirements of this title," § 101—"any claimed invention must be novel, § 102, nonobvious, § 103, and fully and particularly described, § 112." *Bilski*, 130 S. Ct. at 3229. This Court has made clear that these patentability requirements are more than an afterthought. "These limitations serve a critical role in adjusting the tension, ever present in patent law, between stimulating innovation by protecting inventors and impeding progress by granting patents when not justified by the statutory design." *Id.* Section 103—which provides that "[a] patent for a claimed invention may not be obtained ... if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains"—is not just relevant. It is the ideal tool for weeding out the individual problematic patents this Court has identified without placing a whole class of valuable inventions at risk.

A. Obviousness Doctrine Is Comparatively Straightforward and Capable of Addressing the Concerns Identified in This Court's § 101 Precedents.

First and foremost, the test for whether a patent is invalid for obviousness under § 103 is clear and easy to apply, especially when compared to the abstract idea doctrine. This Court has explained that "obviousness" "analysis is objective" and requires an "expansive and flexible" assessment of the claimed invention. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 402, 406, 415 (2007); *see id.* at 419 ("What matters is the objective reach of the claim."). The Court has also set forth the exact contours of the analysis. First, courts and patent examiners must determine the scope and content of the relevant prior art. Second, the level of skill of the ordinary artisan must be identified. Third, the scope and content of the claimed invention must be defined through the process of claim construction. *See KSR*, 550 U.S. at 406. And finally, with that information in hand, courts must determine whether § 103's requirements have been met.

A straightforward application of this Court's obviousness case law makes plain that the patents the Court has identified as problematic under the abstract idea doctrine would be invalid under § 103. If a patent purports to claim the use of a known concept at a high level of generality implemented on a computer using a conventional approach, that patent will be invalid as obvious. In the Federal Circuit's vacated panel opinion in this case, Judge Prost in dissent described the patented method as ancient: "In any event, this basic idea of 'credit intermediation' is not just abstract; it is also literally ancient." *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 685 F.3d 1341, 1357 (Fed. Cir. 2012) (Prost, J. dissenting) (dating back to the Roman Empire). Judge Prost further described implementation on a computer as "incidental," and lacking inventiveness: "One need not be a computer scientist to suspect that this level of computer implementation is not inventive." *Id.* If these statements are taken as true, that would lead to the conclusion that the claims in suit are obvious, since the invention involves no more than the "combination of familiar elements according to known methods" that "yield[s] predictable results" or a "combination" of known elements that "was obvious to try." *KSR*, 550 U.S. at 416, 421.

B. The Courts and the PTO Have Demonstrated Their Capacity to Apply § 103 in a Relatively Clear and Predictable Manner.

Experience bears out the superiority of § 103 as a workable tool for weeding out patents that do no more than implement a well-worn idea on a computer. In stark contrast to its struggles with applying the abstract idea doctrine, the Federal Circuit has displayed relatively little difficulty in applying the concept of obviousness. Indeed, the Federal Circuit has applied this Court's decision in *KSR* on multiple occasions and not once revealed a level of disagreement that comes close to the deep theoretical divisions reflected in the multiple opinions in this case. *See, e.g.*, *Soverain Software LLC v. NewEgg Inc.*, 705 F.3d 1333, 1337-38 (Fed. Cir. 2013); *Thomson Licensing SAS v. Int'l Trade Comm'n*, 527 F. App'x

884, 889 (Fed. Cir. 2013); *Odom v. Microsoft Corp.*, 429 F. App'x 967, 973 (Fed. Cir. 2011); *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1327-33 (Fed. Cir. 2009); *Asyst Techs., Inc. v. Emtrak, Inc.*, 544 F.3d 1310, 1314-15 (Fed. Cir. 2008); *Riocoh Co. v. Quanta Computer Inc.*, 550 F.3d 1325, 1333 (Fed. Cir. 2008); *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1262 (Fed. Cir. 2007); *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (all applying *KSR*). Perhaps even more tellingly, and in contrast to the numerous grants of certiorari in § 101 cases over the last several years, this Court has not needed to take a § 103 case since *KSR*.

The Federal Circuit's decision in *Leapfrog* is particularly instructive. In *Leapfrog*, a unanimous Federal Circuit panel (Judge Mayer, Judge Lourie, and Judge Dyk) held that a pre-existing learning tool for children recast in the medium of modern technology was invalid for obviousness. A tool for allowing a child to identify "a single letter in a word and hear the sound of the letter as it is used in that word" was already known in the art. 485 F.3d at 1161. The invention at issue in *Leapfrog* simply took that tool and "updated [it] with modern electronics that were common by the time of the alleged invention." *Id.* at 1160. As the Federal Circuit explained, "[a]pplying modern electronics to older mechanical devices has be[come] commonplace," and such efforts are undeserving of patent protection under § 103. *Id.* at 1161. Applying exactly that reasoning would result in the § 103 invalidation of the types of patents this

Court has identified as problematic in its § 101 case law.[11]

Federal district courts have also demonstrated their capacity to apply obviousness case law in a relatively straightforward manner—including in cases involving computer-implemented inventions. *See, e.g.*, *Advanceme, Inc. v. RapidPay, LLC*, 509 F. Supp. 2d 593 (E.D. Tex. 2007); *CollegeNet, Inc. v. ApplyYourself, Inc.*, Nos. 02-484, 02-1359, 2008 WL 4793683 (D. Or. Oct. 28, 2008). And clear guidance from the courts has allowed the PTO to develop and apply the post-*KSR* obviousness standard without substantial controversy. *See Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in* KSR International Co. v. Teleflex Inc., 72 Fed. Reg. 57,526 (Oct. 10, 2007); *see* Ali Mojibi, *An Empirical Study of the Effect of* KSR v. Teleflex *on the Federal Circuit's Patent Validity Jurisprudence*, 20 Alb. L.J. Sci. & Tech. 559, 562-64 (2010).

C. Technological Innovation, Respect for Claims as Drafted, and the Need for Increased Patent Quality All Counsel in Favor of Reliance on § 103.

Developments in computer technology have themselves underscored the superiority of § 103 to weed out non-innovative efforts to patent the application to computers of well-understood abstract ideas. Highly innovative computer software has substantially diminished the man-machine interface to the point where it is relatively straightforward to implement ideas on a computer. Section 101 provides no guidance for distinguishing between highly-innovative software and the non-innovative recitation of a series of steps that take an abstract idea and implement it on a computer. Section 103, by contrast, was purpose-built for such an exercise, and provides the tools for ascertaining patentability in individual cases without casting doubt on the patent eligibility of an entire category of highly-innovative computer-implemented inventions.

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[11] The problem of imprecise or vague claims is addressed by 35 U.S.C. § 112's requirement that every claimed invention be fully enabled and described. *See, e.g.*, *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336 (Fed. Cir. 2005); *Biosig Instruments, Inc. v. Nautilus, Inc.*, 715 F.3d 891 (Fed. Cir. 2013) (cert. granted on Jan. 10, 2014).

Moreover, focusing on whether claims are obvious in light of the prior art will force courts and patent examiners to analyze the actual invention claimed. As explained, the abstract idea doctrine requires that a claim be dissected and the abstract idea removed so that what remains of the claim can be evaluated in isolation. That artificial enterprise results in an ill-advised and impermissible rewriting of the claims. Conversely, § 103 analysis requires a detailed focus on the claims (and each element of the claims) as actually drafted.

Relatedly, while the unworkable § 101 analysis does nothing to combat problems with broadly drafted field-preempting patents for computer-implemented inventions, further developing § 103 doctrine can play an important role in increasing patent quality. Section 101's abstract idea exception is a blunt instrument, and every time it is applied all inventions that bear any relation to the relevant abstract idea are called into question. While that creates substantial uncertainty, it does nothing to promote patent quality. Section 103, on the other hand, incentivizes patentees to draft clean claims that distinguish themselves from the prior art and make clear that what is claimed was in no way obvious to the person having ordinary skill in the art. Focusing on the more fine-grained analysis of § 103 in the area of computer-implemented inventions will foster further development of obviousness jurisprudence and thus enhance the quality of patent drafting. It will also avoid needlessly calling into question the patentability of broad swaths of technology and thus foster the certainty that investment in innovation demands.

This Court recognized in *KSR* that obviousness doctrine is a powerful filter, which enables patent examiners to reject obvious claims and, in turn, forces patent applicants to explain why their inventions are deserving of patent protection. *See* 550 U.S. at 427. *KSR* also emphasized that § 103 questions are ultimately questions of law, which should enable courts to analyze obviousness explicitly and thus provide further guidance promoting clear rules. *Id.* Section 103 is thus capable of ensuring that claims that are insufficiently innovative will not receive patent protection.

Finally, focusing on § 103 will help courts and patent examiners resist the temptation to conduct an "inventiveness" analysis under § 101. *Cf. CLS*, 717 F.3d at 1335 (Rader, C.J., additional reflections). This Court has specifically disapproved any analysis of "inventiveness" under § 101, recognizing that "whether a particular invention is novel is 'wholly apart from whether the invention falls into a category of statutory subject matter.'" *Diehr*, 450 U.S. at 190. Before the 1952 Patent Act, courts often attempted to identify whether an invention involved "creative work," "inventive faculty," or a "flash of creative genius" when assessing patentability. *See* Giles S. Rich, *Principles of Patentability*, 28 Geo. Wash. L. Rev. 393, 404 (1960). In an effort to standardize that "inventiveness" inquiry, the 1952 Act codified what is now the § 103 nonobviousness requirement. *See Dann v. Johnston*, 425 U.S. 219, 225-26 (1976) (Explaining that although "an exercise of the inventive faculty" had been used as a judicial test, "it was only in 1952 that Congress, in the interest of uniformity and definiteness, articulated the requirement in a statute, framing it as a requirement of nonobviousness." (internal quotation marks and footnote omitted)); S. Rep. No. 82-1979 Revision Notes, *reprinted in* 1952 U.S.C.C.A.N. 2394, 2410-11 (1952) (Section 103 is an "explicit statement" providing for the invalidation of patents "on the ground of lack of invention."). Focusing on § 103 doctrine thus helps to keep any inquiry into inventiveness where it belongs.

CONCLUSION

For all these reasons, this Court should hold that computer-implemented inventions such as software constitute patent-eligible subject matter under 35 U.S.C. § 101, and that potential patentability problems with such inventions should be addressed under the other requirements of the patent statute, predominantly under 35 U.S.C. § 103.

Respectfully submitted,

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AMICUS
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BRIEF

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No. 13-298

In The Supreme Court of the United States

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ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL
AND CLS SERVICES LTD.,

Respondents.

◆

**On Writ Of Certiorari To The
United States Court Of Appeals
For The Federal Circuit**

◆

BRIEF OF THE JUHASZ LAW FIRM, P.C. AS AMICUS CURIAE SUPPORTING CLS BANK INTERNATIONAL AND CLS SERVICES LTD.

◆

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QUESTION PRESENTED

Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

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BRIEF OF THE JUHASZ LAW FIRM, P.C. AS AMICUS CURIAE SUPPORTING CLS BANK INTERNATIONAL AND CLS SERVICES LTD.

INTEREST OF AMICUS CURIAE[1]

The author of this brief is a registered patent practitioner with law and science degrees and is a member of the patent firm The Juhasz Law Firm, P.C. Paul R. Juhasz has been practicing for 30 years and holds a B.S.Chem.E., a B.S.E.E., a J.D., and a P.E. Paul R. Juhasz deals with the issue of subject matter patentability for clients of the Firm on a regular basis. Mr. Juhasz has written extensively and is extensively published on the Supreme Court's *Bilski* and *Mayo* and *Myriad* decisions and subject matter patentability under 35 U.S.C. § 101. This brief is filed solely on behalf of the Firm and not on behalf of clients of the Firm. Amicus represents neither party in this action, and offers the following views based on extensive experience on this matter.

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[1] Petitioners and Respondents each have filed and lodged with the Clerk a letter of consent to the filing of amicus curiae briefs in support of either party or of neither party. Pursuant to Sup. Ct. R. 37.6, amicus notes that no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than amicus curiae made a monetary contribution to its preparation or submission.

SUMMARY OF ARGUMENT

The Federal Circuit correctly struck down four computer implemented business method patents under § 101 as patent-ineligible.

The message from the Supreme Court in *Bilski* and *Mayo* is that a claim, taken as a whole and excluding extra-solution activity, must be tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea) rather than to preempt the principle itself. So if claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – satisfy the foregoing guidelines, the Answer to the Question "Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?" should be OF COURSE.

CLS Bank provides the Court with a good vehicle to answer the question that lower courts have been unable to address so far: where to draw the preemption-defining boundary line (*i.e.*, the line within which matter is patent-eligible and outside of which it preempts a fundamental principle, and is thus, patent-ineligible). There is close similarity in subject matter of managing risk between the *CLS Bank* and *Bilski* patent claims and unlike in *Bilski*, the patent claims in *CLS Bank* include system and product claims that recite computer structure. Hence, *CLS Bank* will allow the Court to address the spill-over effect of *Bilski* to system and product claims (Beauregard claims in this case) wherein general computing structure is recited to implement a patent-ineligible process.

The challenge for the lower courts has been determining when an abstract idea in a computer implemented business method patent is limited to a particular application so as to not preempt the fundamental principle and when does a recited limitation such as computing structure amount to insignificant extra-solution activity. That is the guidance from the Court's decision in *CLS Bank* that the patent community seeks and needs.

The recited computing structure in all of the claims in the patents in *CLS Bank* are general purpose computers. As Judge Lourie explained, none of the recited limitations adds anything of substance to the claims. The recited computing structure in the claims in *CLS Bank* are extra-solution activities. They are insignificant limitations.

Each claim in *CLS Bank*, taken as a whole and excluding the recited computing structures which are extra-solution activity, are not tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea). Rather, the claims preempt the principle of reducing settlement risk by facilitating a trade through third party intermediation itself.

While the two-step approach of determining preemption and insignificant extra-solution activity is elegant, a simpler one-step test to determine whether a computer-implemented invention is a patent-ineligible "abstract idea" is whether steps that are central to the claim (*i.e.*, not token extra-solution activity) have a "physical" or "virtual" link to a specific real or tangible object.

Recited steps in the method claims of the U.S. 5,970,479 ("the '479 Patent") and U.S. 6,912,510 ("the '510 Patent"); and the system and product (media) claims of U.S. 7,149,720 ("the '720 Patent"); and U.S. 7,725,375 ("the '375 Patent") have neither a "physical" link nor a "virtual" link and so the '479, '510, '720, and '375 Patents are not subject matter patentable under 35 U.S.C. § 101.

◆

ARGUMENT

I. The Answer to the Question "Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?" should be OF COURSE.

This Certiorari was granted on the following question: "Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?"

The answer to this Question should be OF COURSE.

The message from the Supreme Court in *Bilski* and *Mayo* is that a claim, taken as a whole and excluding extra-solution activity, must be tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea) rather than to preempt the principle itself. *Mayo Collaborative v. Prometheus Labs.*, 132 S. Ct. 1289, 1294 (2012); *Bilski, v. Kappos*, 130 S. Ct. 3218, 3231 (2010); *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972); *Parker v. Flook*, 437 U.S. 584, 593, 594 (1978); *Diamond v. Diehr*, 450 U.S. 175, 187 (1981).

Hence, if claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – taken as a whole and excluding extra-solution activity, are tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea) rather than to preempt the principle itself; then those claims to computer-implemented inventions are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court. To hold otherwise is contrary to this Court's precedents.

The answer to the Question "Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?" should thus be OF COURSE.

II. *CLS Bank* provides the Court with a good vehicle to answer the question that lower courts have been unable to address so far: where to draw the preemption-defining boundary line (*i.e.*, the line within which matter is patent-eligible and outside of which it preempts a fundamental principle, and is thus, patent-ineligible).

On December 6, 2013, the Supreme Court granted certiorari in *CLS Bank Intl. v. Alice Corporation*, 717 F.3d 1269 (Fed. Cir. 2013), placing the issue of patent-eligible software, recited computer structure, and business method claims before the Supreme Court, once again.

For more than two years, the Supreme Court has provided guidance through its major decisions on § 101, the appropriate analysis to use in determining whether or not a claim covers patent-eligible matter. The message from the Supreme Court in *Bilski* and *Mayo* is that a claim, taken as a whole and excluding extra-solution activity, must be tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea) rather than to preempt the principle itself. *Mayo*, *supra*, at 1294; *Bilski*, *supra*, at 3231; *Benson*, *supra*, at 72; *Flook*, *supra*, at 593, 594; *Diehr*, *supra*, at 187.

For perhaps the first time, the Federal Circuit en banc *CLS Bank* decision embraced that message in the concurring opinion written by Judge Lourie.

While perhaps not getting the decision entirely right, for the reasons discussed below, the en banc court decision appeared to be a step in the right direction. Yet, instead of embracing and building upon this decision, the patent community and the dissenting judges of the Federal Circuit have responded to the decision with heavy criticism.

Five concurring judges (out of 10 on the panel) agreed with the analytical tools provided by the Supreme Court: first identify the abstract principle and its scope and then determine whether the recited steps that manipulate the abstract principle preempt the abstract principle. *CLS Bank*, *supra*, at 1282. Once the general computing structure was stripped away from the claims as insignificant extra-solution activity, all that remained was the abstract principle, which is not enough.

Applying these analytical tools, these five judges struck down four computer implemented business method patents under § 101 as patent-ineligible, affirming the lower court and effectively reversing an earlier panel decision of the Federal Circuit.

CLS Bank provides the Court with a good vehicle to answer the Question; "Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?" Both are directed to the subject matter of hedging – to manage commodity risk in *Bilski* and financial risk in *CLS Bank*. Further, unlike in *Bilski*, the patent claims in *CLS Bank* include system and product claims that recite computer structure. In effect, *CLS Bank* is *Bilski* with a recited computer. Hence, *CLS Bank* will allow the Court to address the spill-over effect of *Bilski* to system and product claims (Beauregard claims in this case) wherein general computing structure is recited to implement a patent-ineligible process. As the Court in *Diehr* stated "insignificant post-solution activity will not transform an unpatentable principle into a patentable process. To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection." *Diehr*, *supra*, at 192, 193 (1981). *CLS Bank* may have provided the Court with the perfect opportunity to put this dicta to the test.

CLS Bank may also allow the Court to heal the rift between the judges on the Federal Circuit by providing guidance behind which the Federal Circuit judges can hopefully unite in charting a pathway forward for addressing § 101 questions.

CLS Bank thus provides the Court with a good vehicle to answer the question that lower courts have been unable to address so far: where to draw the preemption-defining boundary line (*i.e.*, the line within which matter is patent-eligible and outside of which it preempts a fundamental principle, and is thus, patent-ineligible).

III. The challenge for the lower courts has been determining when an abstract idea in a computer implemented business method patent is limited to a particular application so as to not preempt the fundamental principle and when a recited limitation such as computing structure amounts to insignificant extra-solution activity. That is the guidance from the Court's decision in *CLS Bank* that the patent community seeks and needs.

For guidance on what makes a "process" claim subject matter patentable, the *Bilski* Court pointed to the definition of the term "process" in 35 U.S.C. § 100(b) and the *Benson*, *Flook*, and *Diehr* precedent. *Bilski*, *supra*, at 3229.

Unlike the algorithm in *Benson*, the mathematical formula used for monitoring conditions during the catalytic conversion process in the petrochemical and oil-refining industries in *Flook* was limited so that it could still be freely used outside the petrochemical and oil-refining industries. *Id.* at 589, 590.

Nevertheless, the *Flook* Court rejected "[t]he notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process."

> "The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques. [Footnote 11] The concept of patentable subject matter under §101 is not 'like a nose of wax, which may be turned and twisted in any direction. . . .' *White v. Dunbar*, 119 U.S. 47, 119 U.S. 51." *Id.* at 590.

As the Court later stated in *Diehr*, *Flook* stands for the proposition that the prohibition against patenting abstract ideas "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment" or adding "insignificant post solution activity." See *Diehr*, *supra*, at 191-192. Significantly, the Court noted that "[w]e were careful to note in *Flook* that the patent application in *Flook* did not purport to explain how the variables used in the formula were to be selected, nor did the application contain any disclosure relating to chemical processes at work or the means of setting off an alarm or adjusting the alarm limit. *Ibid.* All the application provided was a "formula for computing an updated alarm limit." *Id.* at footnote 14.

The claims in *Diehr*, however, are not limited to the isolated step of "programming a digital computer," the Court found; rather, they describe a process of curing rubber beginning with the loading of the mold and ending with the opening of the press and the production of a synthetic rubber product that has been perfectly cured – a result heretofore unknown in the art. *Id.* at footnote 15. As the *Diehr* Court explained, "[w]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of 35 U.S.C. §101." *Id.* at 192. Because the Court did not view respondents' claims as an attempt to patent a mathematical formula, but rather to be drawn to an industrial process for the molding of rubber products, the *Diehr* Court affirmed the judgment of the Court of Customs and Patent Appeals. *Id.* at 192, 193.

In finding the commodity claims in *Bilski* to be non-statutory subject matter, the *Bilski* Court explained that:

> "Petitioners' remaining claims are broad examples of how hedging can be used in commodities and energy markets. *Flook* established that limiting an abstract idea to one field of use or adding token post solution components did not make the concept patentable. That is exactly what the remaining claims in petitioners' application do."

Bilski, *supra*, at 3231.

Finally, as this Court explained in *Mayo*:

> Those cases warn us against interpreting patent statutes in ways that make patent eligibility "depend simply on the draftsman's art" without reference to the "principles underlying the prohibition against patents for [natural laws]." *Flook*, *supra*, at 593. They warn us against upholding patents that claim processes that *too broadly preempt the use of a natural law*. *Morse*, *supra*, at 112-120; *Benson*, *supra*, at 71-72. And they insist that a process that focuses upon the use of a natural law also contains other elements or a combination of elements, sometimes referred to as an "inventive concept," sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself. *Flook*, *supra*, at 594; see also *Bilski*, *supra*, at ___, 130 S. Ct. at 3230 ("[T]he prohibition against patenting abstract ideas 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment' or adding 'insignificant postsolution activity'"

(quoting *Diehr*, *supra*, at 191-192)). (*Emphasis added.*) *Mayo, supra* at 1294.

Simply put, limiting an abstract idea to one broad field of use or insignificant extra-solution activity will not transform an unpatentable principle into a patentable process. *Diehr*, *supra*, at 191, 192. To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection. *Id.* at 192.

The challenge for the lower courts is thus twofold. The first is determining when an abstract idea in a computer implemented business method patent is limited to a particular application so as to not preempt the fundamental principle. The second is determining when a recited limitation (even if it is an apparatus or structural limitation), such as computing structure is insignificant – *i.e.*, the equivalent of insignificant extra-solution activity in a method claim. That is the guidance from the Court's decision in *CLS Bank* that the patent community seeks and needs.

IV. The recited computing structure in all of the claims in the patents in *CLS Bank* are general purpose computers. As Judge Lourie explained, none of the recited limitations adds anything of substance to the claims. The recited computing structure in the claims in *CLS Bank* are insignificant limitations.

The first challenge for the lower courts has been determining when does a recited limitation such as computing structure amount to insignificant extra-solution activity. A published journal article which surveys the jurisprudence on this point can be found in "*How to Patent Business, Software, and Medical Diagnostic Methods in the Aftermath of the Bilski Decision – Part 2, Business and Software Methods*," P. Juhasz, IP Litigator, Vol. 17, Number 1 (Aspen Publishers, January/February 2011), available at http://patenthorizon.com/main/wp-content/uploads/2011/10/2011-IP-Litigator-Jan-Feb-How-to-Patent-Business-Software-and-Medical-Diagnostic-Methods-in-the-Aftermath-of-the-Bilski-Decision-Part-2-Business-and-Software-Methods.pdf.

In that survey of the case law the following observations become clear. A high level general recitation of computing structure is not enough to make the recited computing structure meaningful. On the other hand, the recitation of general computer structure does not *per se* make the recited computing structure insignificant. The question is whether there is enough recited detail about the computer and the way it is programmed to take it away from being a high level general computing structure and make it into an application specific computer.

For example, if a computer is recited to perform the function X, Y, and Z, that is not enough since it does not recite how the computer is carrying out the function. There must be recited details of how the computing structure is performing the function. Alternatively, the claim can be recited in means plus function format such that limitations are imported into the claims from the specification pursuant to 35 U.S.C. § 112(f).

Some examples of computing structure recited without details sufficient to make the computer a specific computer include: running a business method on a computer or over the internet without more; failure to specify precisely how the computer hardware and database are 'specially programmed,' and claiming a central process as doing nothing more than performing as a general purpose computer that has been programmed in some unspecified manner; listing of computer components by tossing in references to internet commerce; crafting claims as a Beauregard type claim; gathering data can fairly be characterized as insignificant extra-solution activity; failure to specify any particular type or nature of data or how or from where the data is obtained or what the data represents undercuts patentability of graphically displayed data; a mathematical algorithm that uses machines for data input and data output and to perform the required calculations but imposes no limit on the process itself is merely insignificant post solution activity; failure to visually display generated profiles may lead to unpatentable claims; running a business method on a computer to create data representing abstract objects may not be enough. P. Juhasz, IP Litigator, *supra*.

Some examples of computing structure recited with details sufficient to make the computer a specific computer include: electronic transformation of data is patentable; data representing physical and tangible objects and their respective structures may be patentable even without a visual depiction of the data; specific computer having particular programming so as to amount to a specific computer architecture. *Ibid.*

The claims in *CLS Bank* include method, system and Beauregard claims reciting elements like "creating a shadow credit record and a shadow debit record" for each party and "electronically adjust[ing] said shadow credit record or shadow debit record" to ensure the monies were available come time to settle. On a plain reading, the claims in *CLS Bank* arguably recite no more than the presence of a computer. There is no detail about how the computer carries out the task.

Judge Lourie explained that none of the recited limitations adds anything of substance to the claim:

> "First, the requirement for computer implementation could scarcely be introduced with less specificity; the claim lacks any express language to define the computer's participation. In a claimed method comprising an abstract idea, generic computer automation of one or more steps evinces little human contribution. . . . Nor does requiring the supervisory institution to create and adjust a 'shadow credit record' and a 'shadow debit record' narrow the claims from the realm of abstraction. . . . Viewed properly as reciting no more than the necessary tracking activities of a supervisory institution, the steps relating to creating a 'shadow record' and then obtaining and adjusting its balance are insignificant '[pre]-solution activity' . . . .

> Finally, providing end-of-day instructions to the exchange to reconcile the parties' real-world accounts with the day's accumulated adjustments to their shadow records is a similarly trivial limitation that does not distinguish the claimed method." *CLS Bank*, *supra*, at 1286-1287.

In the concurring in part and dissenting in part en banc *CLS Bank* decision, Chief Judge Rader imported computer application specific limitations into the claims from the specification that were not recited in the claims. *Id.* at 1328. For example, "[t]he computer and other hardware are specifically programmed to solve a complex program and are supported by numerous flowcharts that provide algorithm support for the functions recited in the claims." *Id.* at 1307-1309. The same goes for the dissenting en banc *CLS Bank* decision. For example, "the court can reasonably assume for present purposes that the terms 'shadow' credit and/or debit record and 'transaction' in the '479 patent recite electronic implementation and a computer or an analogous electronic device." *CLS Bank*, *supra*, at 1328.

Claims should be limited to computer application specific structure only if the claims expressly recite such application-specific limitations, the claims are written in means plus function format such that limitations are imported into the claims from the specification pursuant to 35 U.S.C. § 112(f), or a Markman claim construction process properly imports such computer application specific limitations into the claims. The claims in the patents in *CLS*

Bank are without those limitations. The claims do not recite computer architecture specially programmed. The claims do not recite physical or virtual links to physical and tangible and not abstract objects.

The recited computing structure in all of the claims in the patents in *CLS Bank* are general purpose computers. As Judge Lourie explained, none of the recited limitations adds anything of substance to the claim. The recited computing structure in the claims in *CLS Bank* are the equivalent of extra-solution activities in a method claim. The recited computing structure on the patents in *CLS Bank* are insignificant limitations.

V. Each claim in *CLS Bank*, taken as a whole and excluding the recited computing structures which are extra-solution activity, are not tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea). Rather, the claims preempt the principle of reducing settlement risk by facilitating a trade through third party intermediation itself.

The second challenge for the lower courts has been determining when an abstract idea is limited to a particular application so as to not preempt the fundamental principle.

On one end of the preemption/non-preemption spectrum lies *Benson*. In *Benson*, the Supreme Court considered claims to computer-implemented methods "for converting binary-coded decimal (BCD) numerals into pure binary numerals." 409 U.S. at 64. The claims each recited a series of data manipulation steps for effecting the indicated numerical conversion and "purported to cover any use of the claimed method in a general-purpose digital computer of any type." *Ibid.*

The Court identified the abstract idea at issue as the formula for performing BCD to pure binary conversion. *Id.* at 65. The Court found the claims were "so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion" and would thus reach every application of the basic conversion algorithm. *Id.* at 68-69. Accordingly, the claims were held ineligible for patenting under § 101.

The Court in ***Bilski*** also found claims on a well known hedging strategy to reach every application of the basic hedging strategy. In finding the commodity claims in ***Bilski*** to be non-statutory subject matter, the ***Bilski*** Court explained that:

> "Petitioners' remaining claims are broad examples of how hedging can be used in commodities and energy markets. ***Flook*** established that limiting an abstract idea to one field of use or adding token post solution components did not make the concept patentable. That is exactly what the remaining claims in petitioners' application do." ***Bilski***, ***supra***, at 3231.

On the other end of the preemption/non-preemption spectrum lies *Diehr*. The claims in *Diehr*, however, are not limited to the isolated step of "programming a digital computer," the Court found; rather, they describe a process of curing rubber beginning with the loading of the mold and ending with the opening of the press and the production of a synthetic rubber product that has been perfectly cured – a result heretofore unknown in the art. *Id.* at footnote 15. As the *Diehr* Court explained, "[w]hen a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of 35 U.S.C. §101." *Id.* at 192. Because the Court did not view respondents' claims as an attempt to patent a mathematical formula, but rather to be drawn to an industrial process for the molding of rubber products, the *Diehr* Court affirmed the judgment of the Court of Customs and Patent Appeals. *Id.* at 192, 193.

In between the two ends of the preemption/non-preemption spectrum lies *Flook*. Unlike the algorithm in *Benson*, the mathematical formula used for monitoring conditions in *Flook* during the catalytic conversion process in the petrochemical and oil-refining industries was limited so that it could still be freely used outside the petrochemical and oil-refining industries. *Id.* at 589, 590. Although the claim would not "wholly preempt" the mathematical formula, *id.* at 580, the Court held that the claimed process fell under the abstract ideas exception to patentability. The *Flook* Court rejected "[t]he notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process." *Id.* at 590.

Clearly, no field of use limitation as in *Benson* and *Bilski* amounts to preemption. Similarly, limitations as in *Flook* that are so abstract and sweeping as to cover both known and unknown uses of the algorithm in a particular-broad application may also amount to preemption. In either case, the claims contain no limitations that would bind the abstract idea or algorithm to a particular use or application such that the claim effectively tries to encompass the abstract idea itself (*i.e.*, there is preemption), and the claim is not patent-eligible. However, if one or more recitations that limit the particular application as in *Diehr* to a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of 35 U.S.C. § 101. *Id.* at 192. In other words, claims that recite a particular/specific application of an abstract idea may well warrant patent protection.

The claims in the patents in *CLS Bank* preempt the principle of reducing settlement risk by facilitating a trade through third party intermediation. As

Judge Lourie explained, "[t]he concept of reducing settlement risk by facilitating a trade through third party intermediation is an abstract idea because it is a "disembodied" concept. *Id.* at 1286. Each claim in *CLS Bank*, taken as a whole and excluding the recited computing structures which are extra-solution activity, are not tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea). Rather, the claims preempt the principle of reducing settlement risk by facilitating a trade through third party intermediation itself. *Mayo*, *supra*, at 1294; *Bilski*, *supra*, at 3231; *Benson*, *supra*, at 72; *Flook*, *supra*, at 593, 594; *Diehr*, *supra*, at 187.

VI. While the two-step approach of determining preemption and insignificant extra-solution activity is elegant, a simpler one-step test to determine whether a computer-implemented invention is a patent-ineligible "abstract idea" is whether steps that are central to the claim (*i.e.*, not token extra-solution activity) have a "physical" or "virtual" link to a specific real or tangible object.

Benson, *Flook*, *Diehr*, and *Bilski* stand for the proposition that a process claim taken as a whole and excluding extra-solution activity must be tailored narrowly enough to encompass only a particular application of a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea) rather than to preempt the principle itself. *Mayo, supra*, at 1294; *Bilski, supra*, at 3218; *Benson, supra*, at 65; *Flook, supra*, at 594; and *Diehr, supra*, at 175. The 35 U.S.C. § 101 challenge post-*Bilski* thus is to define the boundary line of an invention involving an abstract idea, law of nature, or natural phenomenon beyond which the invention preempts one of these categories and is therefore unpatentable subject matter, and within which it is patentable.

While it is expected that there is no bright line rule that will work in every case, for guidance on where to define this boundary line, the *Bilski* Court pointed to the trilogy of *Benson-Flook-Diehr* as precedent. *Bilski, supra*, at 3231.

From the *Benson-Flook-Diehr* spectrum of inventions involving a fundamental principle may be gleaned the guidance of the court on determining when an abstract idea in a computer implemented business method patent is limited to a particular application so as to not preempt the fundamental principle – the first of the two challenges faced by lower courts post-*Bilski*. From the *Benson-Flook-Diehr* spectrum of inventions may further be gleaned the guidance of the court on determining when does a recited limitation such as computing structure amount to insignificant extra-solution activity – the second of the two challenges faced by lower courts post-*Bilski*.

While addressing the foregoing challenges in a two-step process as guided by the Court provides an elegant way to determining the patent eligibility of computer implemented business method patents, this approach still requires two steps in making that determination – namely determining whether a recited limitation is meaningful and determining the preemption question. If each step of the two-step approach is rigorously applied in a systematic, objective manner, the foregoing approach may lead to the evolution of uniform jurisprudence. On the other hand, the determination of whether a recited limitation is meaningful and determining the preemption question may each lend itself to some subjectivity depending on the trier of law. When the two determinations are taken together, such subjective variations may further increase the likelihood of subjectivity in § 101 jurisprudence.

There is a threshold for subject matter patentability that may also be gleaned from the *Benson-Flook-Diehr* spectrum of inventions involving a fundamental principle, which may lend itself to a one-step approach in determining the patent eligibility of computer implemented business methods or, for that matter, software patents. That threshold is the existence of a "link" of the invention to a specific physical or tangible object. The invention in *Diehr* was held patentable because it connected to (more specifically, the data or electrical signals generated by the software *manipulated*) the physical and tangible objects of a "mold" and a "press" through the steps of "loading of the mold" and "opening of the press."

Patentability in *Flook* failed since the claims were without any such link.

More specifically, the *Diehr* Court stated that "[w]e were careful to note in *Flook* that the patent application did not purport to explain how the variables used in the formula were to be selected, nor did the application contain any disclosure relating to chemical processes at work or the means of setting off an alarm or adjusting the alarm limit." *Diehr*, *supra*, at footnote 14. All the application provided was a "formula for computing an updated alarm limit." *Ibid.* One interpretation of these comments on *Flook* in *Diehr* is that there was no "link" of the data to a physical or tangible object. "Diehr's claims, however, are not limited to the isolated step of programming a digital computer," the Court explained. *Id.* at footnote 15. Rather, "they describe a process of curing rubber beginning with the loading of the mold and ending with the opening of the press and the production of a synthetic rubber product that has been perfectly cured – a result heretofore unknown in the art." *Ibid.* In other words, there was a "link" of the data to a specific physical or tangible object (*i.e.*, a "manipulation" by the data of a physical or tangible object).

Hence, in *Diehr*, software that *manipulates* a specific physical or tangible object (*i.e.*, "physically links" to a physical or tangible object) is patentable subject matter (*e.g.*, the software manipulated data in *Diehr* signaled a device when to open the molding press and remove the cured rubber product). The same should be considered true for "virtual links," where the data that are transformed or manipulated, while not physical objects themselves, ***are representations of a specific physical or tangible object***, as in the Fifth claim of Morse (*e.g.*, Morse code dot and dash signs representing the changing state of a physical object, such as on-off tones, lights, or clicks, in telegraphic use were held patentable). *O'Reilly v. Morse*, 56 U.S. 62 (1853).

The *Morse* case is one of the bedrock cases in U.S. patent jurisprudence. In his original 1837 petition to the Commissioner of Patents, Morse described his fifth claim as: "[a] dictionary or vocabulary of words, numbered and adapted to this system of telegraph." *Id.* at 76. In the 1848 reissue of the patent, Morse's fifth claim recited:

> "the system of signs, consisting of dots and spaces, and of dots, spaces, and horizontal lines, for numerals, letters, words, or sentences, substantially as herein set forth and illustrated, for telegraphic purposes." *Id.* at 86.

In examining Morse's fifth claim, the Supreme Court held: "We perceive no well-founded objection . . . to his right to a patent for the first seven inventions set forth in the specification of his claims." *Id.* at 112. In other words, the fifth claim recited patentable subject matter.

The Morse system claim was patentable arguably because the recited system *represented* a physical object (*e.g.*, Morse code dot and dash signs representing the change in state of a physical object (*e.g.*, switch)) or a tangible object (such as on-off tones, lights, or clicks, in telegraphic use) despite arguably recited without any physical link to (*i.e.*, any physical manipulation of) any physical or tangible objects. Hence, an invention that manipulates data *representing* a specific physical or tangible object (*i.e.*, that contains a "virtual link") should also be subject matter patentable under the Supreme Court's *Morse* precedent.

Also instructive on "virtual links," that is, the idea that *manipulation of data representing a physical or tangible object* is sufficient to provide patentable subject matter, is *In re Abele,* 684 F.2d 902 (CCPA 1982). In *Abele* the Court of Customs and Patent Appeals held unpatentable a broad independent claim reciting a process of graphically displaying variances of data from average values. *Id.* at 908. That claim did not specify any particular type or nature of data; nor did it specify how or from where the data was obtained or what the data represented. One dependent claim, however, was drawn to patent-eligible subject matter where it recited that "said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner." *Id.* at 908-909. As was explained by the Federal Circuit in *In re Bilski*, 2008 U.S. App. LEXIS 22479; 545 F.3d 943; 88 U.S.P.Q.2d 1385 (BNA) (Fed. Cir. 2008) (en banc), the data in *Abele*: "clearly represented physical and tangible objects, namely the structure of bones, organs, and other body tissues. Thus, the transformation of that raw data into a particular visual depiction of a physical object on a display was sufficient to render that more narrowly claimed process patent-eligible." *Id.* at *50.

The term "physical" or "tangible" covers all things that exist in the real world rather than things that are imaginary or that exist only in the mind. Anything existing in the real world includes both those things that can be directly perceived, touched, or manipulated, and physical phenomena, such as electrical signals, electromagnetic radiation, or chemical properties which, while existing in the real world, may only be perceived or manipulated indirectly, such as with the assistance of a machine or apparatus, or by a chemical reaction.

The clue to the patentability of software may thus lie in the *manipulation* by the data (*e.g.*, the electrical data or signals generated by the software instructions) of physical and tangible objects whether physically (*i.e.*, by a "physical link") as in *Diehr* (*i.e.*, the electrical data or signals generated by the software instructions are manipulating in this case *physical* [not tangible] objects of a "mold" and a "press" through the steps of "loading of the mold" and "opening of the press") or *virtually* (*i.e.*, by a "virtual link"), that is to say, by electrical signals or data generated by the software instructions *representing physical or tangible objects* as in *Morse* (*e.g.*, opening or closing of a telegraphic switch).

The "physical link" and "virtual link" patent claim approach may thus be helpful in defining that boundary line beyond which a claim preempts a fundamental principle (*i.e.*, a law of nature, natural phenomena, or an abstract idea) and within which the claim does not under the Supreme Court's *Diehr* and *Morse* precedent.

VII. Recited steps in the method claims of the U.S. 5,970,479 ("the '479 Patent") and U.S. 6,912,510 ("the '510 Patent"); and the system and product (media) claims of U.S. 7,149,720 ("the '720 Patent"); and U.S. 7,725,375 ("the '375 Patent") have neither a "physical" link nor a "virtual" link and so the '479, '510, '720, and '375 Patents are not subject matter patentable under 35 U.S.C. § 101.

The patents are directed to the two-part financial transaction, well known in the art, of first agreeing to a contract at one time, and then exchanging items of value, in this case making payment on the contract (*i.e.*, settlement of the contract) at another time. The patents in *CLS Bank* describe a system for minimizing the risk that, at the time of settlement of the contract, one bank will no longer have enough money to satisfy its payment obligation to the other under the contract. The asserted patent claims are method claims 33 and 34 of U.S. 5,970,479 ("the '479 Patent"); all method claims of U.S. 6,912,510 ("the '510 Patent"); and system and product (media) claims of U.S. 7,149,720 ("the '720 Patent") and U.S. 7,725,375 ("the '375 Patent").

As explained above, the link of data or electrical signals generated by software instructions to something "real" (either by "physical" manipulation of a physical or tangible object, or by "virtual" manipulation of data *representing* a physical or tangible object) provides a useful clue to the patent eligibility of inventions involving processes. As explained in the following, in neither of the asserted claims does the data of the software link to something "real." In neither of the asserted claims does the software *manipulate* a specific physical or tangible object. The asserted claims are without any "physical" or "virtual" link and hence are unpatentable subject matter under this Court's *Diehr* and *Morse* precedent.

Method claim 33 of the '479 Patent is illustrative of '479 and '510 Patents:

> 33. A method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations, the method comprising the steps of:
>
> (a) creating *a shadow credit record* and *a shadow debit record* for each stakeholder party to be held independently by a supervisory institution from the exchange institutions;
>
> (b) obtaining from each exchange institution *a start-of-day balance for each shadow credit record and shadow debit record*;

> (c) for *every transaction resulting in an exchange obligation*, the supervisory institution adjusting each respective party's shadow credit record or shadow debit record, allowing only these transactions that do not result in the value of the shadow debit record being less than the value of the shadow credit record at any time, each said adjustment taking place in chronological order; and
>
> (d) at the end-of-day, the supervisory institution instructing one of the exchange institutions to exchange credits or debits to the credit record and debit record of the respective parties in accordance with the adjustments of the said permitted transactions, *the credits and debits being irrevocable, time invariant obligations* placed on the exchange institutions. (Emphases added.)

The operative nouns in the recited process are shown *italicized above*. They include terms like "*a shadow credit record and a shadow debit record*," "*start-of-day balance*," "*transaction*," and "*obligations*"; not one term being a physical or tangible thing. The italicized operative nouns are no different than the "commodity transactions" in *Bilski*, which the Supreme Court held to be abstract. *Bilski*, *supra*, at 3231.

The operative gerunds in the recited process are shown underlined above. They include terms like "adjusting." They operate on abstract things like "shadow credit" (*i.e.*, operative nouns) and so provide no "physical" or "virtual" link to anything real or tangible. Hence, they fail 35 U.S.C. § 101 for the same reason that the "hedging" of an abstract commodity transaction in *Bilski* failed 35 U.S.C. § 101.

Hence, in neither of the asserted claims of the '479 and '510 Patents can it be said that the data or electrical signals of the software instructions link to something "real." In neither of the asserted claims does the software *manipulate* a specific physical or tangible object. The asserted claims are without any "physical" or "virtual" link and hence are unpatentable subject matter under the Supreme Court's *Diehr* and *Morse* precedent.

Illustrative of the system and product (media) claims of the '720 Patent is system Claim 1 which recites:

> 1. **A data processing system** to enable the exchange of *an obligation between parties*, the system comprising:
>
> **a data storage unit** having stored therein *information about a shadow credit record and shadow debit record for a party, independent from a credit record and debit record* maintained by an exchange institution; and
>
> **a computer**, coupled to said data storage unit, that is configured to (a) receive *a transaction*; (b) electronically adjust *said shadow credit record and/or said shadow debit record* in order *to effect an exchange obligation* arising from said transaction, allowing only those transactions that do not result in a value of said shadow debit record being less than a value of said shadow credit record;

> and (c) generate *an instruction to said exchange institution at the end of a period of time to adjust said credit record and/or said debit record* in accordance with the adjustment of said shadow credit record and/or said shadow debit record, wherein *said instruction being an irrevocable, time invariant obligation* placed on said exchange institution. (Emphases added.)

Claim 1 of the '720 Patent recites structure which has been emphasized above by **bold lettering**. The structure consists of the **"a data processing system"** recited in the preamble and the terms **"a data storage unit having stored therein"** and "**a computer** . . . configured to," both recited in the body of the claim.

Neither recited structure *does anything other than* what conventional, systems, data storage units, and computers do – namely, provide a working order of things (*i.e.*, system), data storage (*i.e.*, data storage unit), and computing (*i.e.*, a computer). Hence, the subject matter patentability of Claim 1 of the '720 Patent *should be determined by the functionality implemented by this structure* which are defined by the operative noun and operative gerund terms and whether or not they preempt an abstract principle.

The operative nouns in the recited process are shown *italicized* above. They include terms like "*information about a shadow credit record and shadow debit record for a party*," "*obligation*," and "*instruction*"; not one term being a physical or tangible thing.

The italicized operative nouns are no different than the "commodity transaction" in *Bilski*, which the Supreme Court held to be abstract. *Bilski*, *supra*, at 3231.

The operative gerunds in the recited process are shown underlined above. They include terms like "the exchange of," "having stored therein," "configured to," "electronically adjust." They operate on abstract things like an "obligation" (*i.e.*, operative nouns) and so provide no "physical" or "virtual" link to anything real or tangible. Hence, they fail 35 U.S.C. § 101 for the same reason that the "hedging" of an abstract commodity transaction in *Bilski* failed 35 U.S.C. § 101.

Hence, in neither of the claims of the '720 Patent can it be said that the data or signals from the software instructions link to something "real." In neither of the asserted claims does the software *manipulate* a specific physical or tangible object. The asserted claims are without any "physical" or "virtual" link and hence are unpatentable subject matter under the Supreme Court's *Diehr* and *Morse* precedent.

Illustrative of the '375 Patent is claim 39 which recites:

> 39. A **computer program product** comprising
>
> **a computer readable storage medium** having *computer readable program code* **embodied in the medium** for use by a party to exchange *an obligation* between a first party

and a second party, the computer program product comprising:

program code for causing **a computer to send** *a transaction* from said first party relating to *an exchange obligation arising from a currency exchange transaction* between said first party and said second party; and

program code for causing **a computer to allow viewing** *of information relating to* processing, by a supervisory institution, *of said exchange obligation*, wherein said processing includes

(1) maintaining *information about a first account* for the first party, independent from *a second account* maintained by a first exchange institution, *and information about a third account* for the second party, independent from *a fourth account* maintained by a second exchange institution;

(2) electronically adjusting *said first account and said third account*, *in order to effect an exchange obligation arising from said transaction* between said first party and said second party, after ensuring that said first party and/or said second party have *adequate value in said first account* and/or *said third account*, respectively; and

(3) generating *an instruction* to said first exchange institution and/or said second exchange institution *to adjust said second account and/or said fourth account in accordance with the adjustment of said first*

> *account and/or said third account*, wherein said instruction being *an irrevocable, time invariant obligation* placed on said first exchange institution and/or said second exchange institution. (Emphases added.)

Like Claim 1 of the '720 Patent, the '375 Patent recites structure which has been emphasized above **by bold lettering**. The structure is **"a computer program product"; "a computer readable storage medium"; "embodied in the medium"; "a computer to send a transaction"**; and **"a computer to allow viewing of information."**

The recited structure *does nothing other than* what conventional computer product or readable storage medium, flashed memory, or a computer to send or to allow viewing of information do – namely, provide a computer product, readable storage medium, a setting of switches in silicon (*e.g.*, embodied in), or a computer that enables sending or viewing of information. So subject matter patentability of Claim 1 of the '375 Patent *should be determined by the functionality implemented by this structure* which are defined by the operative noun and operative gerund terms and whether or not they preempt an abstract principle.

The operative nouns in the recited process are shown *italicized above*. They include terms like "*computer readable program code*" (*i.e.*, instructions); "*obligation*"; "*currency exchange transaction*"; "*first, second, third, fourth accounts*"; "*information*"; and "*adequate value*." Not one of these operative nouns is a physical or tangible thing. The italicized operative terms are no different than the "commodity contract" in *Bilski*, which the Supreme Court held to be abstract. *Bilski*, *supra*, at 3231.

The operative gerunds in the recited process are shown underlined above. They include terms like "to exchange"; "for causing"; "maintaining"; "electronically adjusting"; "generating." They operate on abstract things like "account information" (*i.e.*, operative nouns) and so provide no "physical" or "virtual" link to anything real or tangible. Hence, they fail 35 U.S.C. § 101 for the same reason that the "hedging" of an abstract commodity transaction in *Bilski* failed 35 U.S.C. § 101.

Hence, in neither of the claims of the '720 Patent can it be said that the data or signals from the software instructions links to something "real." In neither of the asserted claims does the software *manipulate* a specific physical or tangible object. The asserted claims are without any "physical" or "virtual" link and hence are unpatentable subject matter under the Supreme Court's *Diehr* and *Morse* precedent.

◆

CONCLUSION

The forgoing reasoning should be adopted in affirming the judgment of the Federal Circuit.

Respectfully submitted,

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In The Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

—v—

CLA BANK INTERNATIONAL, et al.,

Respondents.

**On Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit**

BRIEF OF AMICI CURIAE JAMES B. LAMPERT AND DAVID A. CHAVOUS IN SUPPORT OF NEITHER PARTY

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QUESTION PRESENTED

Whether claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

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for the Federal Circuit

BRIEF OF AMICI CURIAE JAMES B. LAMPERT AND DAVID A. CHAVOUS IN SUPPORT OF NEITHER PARTY

INTEREST OF AMICI CURIAE*

James B. Lampert practiced patent law for almost fifty years and is now largely retired. For fifteen years, he taught patent law at the Boston University Law School. David A. Chavous is a practicing patent attorney with a PhD in Biology. Mr. Lampert and Dr. Chavous are both interested in the sound development of the patent law, including a test and procedure that both the United States Patent and Trademark Office ("USPTO") and the courts can apply to determine whether a patent claim is patent-eligible.

* * *

SUMMARY OF ARGUMENT

This Court has long held that "laws of nature, physical phenomena and abstract ideas" are "excluded from . . . patent protection," and also that "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection. *Diamond v. Diehr*, 450 U.S. 175, 185, 187 (1981) ("*Diehr*").

A question plaguing the patent system, not only with software-related and business method patents, but also in biotechnology and the life sciences, is when such an application becomes "deserving of patent protection." In *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. ____, 132 S.Ct. 1289, 1297 (2012) (emphasis in original), this Court said "the question before us is whether the claims do significantly more than simply describe these natural relations. To put the matter more precisely, do the patent claims add enough to their statements of the correlations to allow the processes they describe to qualify as patent-eligible processes that apply natural laws?"

---

* The parties have consented in writing to the filing of amicus briefs. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution to fund the preparation or submission of this brief. No person other than the amici curiae has made a monetary contribution to fund the preparation or submission of this brief.

This Court's prior decisions make clear what is "enough." The claim, considered as a whole (*Diehr*, 450 U.S. at 188) must be non-obvious, and in determining whether this is so, "natural relations" or other excluded subject matter must be treated as prior art. Simply stated, the test established by this Court's prior decisions is:

> Treating the underlying excluded subject matter (*e.g.*, Alice's concept of reducing settlement risk) as prior art, is the claim as a whole new and non-obvious?

If a claim as a whole is obvious, the claim is not patent-eligible. If a claim as a whole is non-obvious, the claim probably is patent-eligible.[1] The only analysis this test requires—is the claim new and non-obvious—is one that both the USPTO and the courts regularly apply. Because the test provided by this Court's prior decisions is familiar, it should enable the Federal Circuit to give both lower courts and the USPTO the guidance they so badly need.

---

[1] We say "probably" because there may be situations when even a non-obvious claim might foreclose too much potential use of the underlying excluded subject matter. For example, in *Gottschalk v. Benson*, 409 U.S. 63, 71-72 (1972), this Court said that:

The Federal Circuit has refused to treat excluded subject matter as prior art when trying to determine if a claim that encompasses such excluded subject matter is patent-eligible. Indeed, in the two principal opinions in the en banc decision now before this Court, all ten Federal Circuit judges rejected the proposition that Alice's claimed use of a computer to implement the underlying concept of reducing settlement risk had to be either novel or non-obvious. None of their seven en banc opinions considered whether Alice's concept of reducing risk should be treated as prior art, or whether any of the added limitations in Alice's claims would render the claims as a whole (taking the concept as prior art) non-obvious.

Because it has not recognized this Court's long-standing and basic principles, the Federal Circuit has been unable to articulate a coherent or workable

---

> The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself,

but did not address whether the claim, taken as a whole, was obvious.

test of what adds "enough." The Federal Circuit also has not provided either the lower courts or the USPTO coherent guidance for deciding when "an application" of excluded subject matter "may well be deserving of patent protection . . . ."

The test annunciated by this Court's precedents and set forth above would provide meaningful guidance. It would allow USPTO examiners–who are the gatekeepers to the patent system and who must initially decide whether a patent should or should not be granted–to determine whether a claim as a whole is non-obvious, using, *e.g.*, the familiar analysis set forth in ***KSR Int'l v. Teleflex, Inc.***, 550 U.S. 328 (2007). Every examiner uses the analytical framework of ***KSR*** almost every day as a matter of course.

It would also provide needed guidance to the lower courts. Obviousness is an analysis they regularly undertake; and because an issued patent has already gone through the USPTO filter, a court's analysis in most cases should be greatly simplified. The USPTO record typically will already have differentiated between the aspects of a claimed invention which are excluded subject matter, and those that apply excluded subject matter and potentially make a claim patent-eligible. The Federal Circuit decision here, and its later decisions in *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013) and *Accenture Global Services v. Guidewire Software*, 728 F. 3d 1336 (Fed. Cir. 2013) are typical. The Federal Circuit has had no difficulty in sorting out the underlying "abstract" idea and the potentially "meaningful" limitations in the claims.

The same is true in the vast majority, if not all, of this Court's prior "subject matter" decisions, *e.g.*, *LeRoy v. Tatham*, 55 U.S. (14 How.) 156 (1852), *O'Reilly v. Morse*, 56 U.S. (15. How.) 62 (1853), *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948), *Gottschalk v. Benson*, 409 U.S. 63 (1972), *Parker v. Flook*, 437 U.S. 584 (1978)("*Flook*"), *Diehr*, *Bilski v. Kappos*, 561 U.S. ___, 130 S. Ct. 3218 (2010), *Mayo*, and *Association for Molecular Pathology v. Myriad Genetics*, 569 U.S. ___, 133 S.Ct. 2107 (2013)("*Myriad*"). In each, there appears to have been little or no dispute about what was the "idea" and what was its "application." In each, the result would have been exactly the same if the test suggested here had been applied. Only in *LeRoy* (where the patent was directed to a machine and not to the underlying principle) and *Diehr* (where it was "nowhere suggested that all these steps, or at least the combination of those steps, were in context obvious, already in use, or purely conventional" (*Mayo*, 132 S.Ct. at 1299)) could the claims at issue have been found non-obvious.

The amici curiae recognize that others may argue that this test improperly combines Sections 101 (subject matter) and 103 (obviousness); or that under this Court's prior decisions, a claim that involves excluded subject matter is patent-eligible if either (i) the claim (taking the excluded subject matter as prior art) is new and non-obvious, or (ii) the claim is limited so that it does not effectively cover all practical applications of the excluded subject matter.

However, this brief argues that it is entirely proper for a court to hold a claim invalid under § 101 in cases, such as that here and in this Court's prior decisions, when it is clear that only the excluded subject matter is potentially non-obvious.[2] In *Mayo*, 132 S.Ct. at 1303, this Court said that relying on Sections 102 and 103 to perform the "screening function" would "make the 'law of nature' exception to § 101 patentability a dead letter," "is not consistent with prior law," and that "to shift the patent-eligibility inquiry entirely to these later sections risks creating significantly greater uncertainty."

As for the two requirements—(i) that the excluded subject matter must be "considered as if . . . well known" (*Parker v. Flook*, 437 U.S. at 592), and (ii) that excluded subject matter must remain "free to all men and reserved exclusively to none" (*Funk*, 333 U. S. at 130)—they are inexorably intertwined. The first ensures the second. If a claim is limited to what the patentee contributed above and beyond the excluded subject matter itself, it will almost necessarily not unacceptably "preempt."

ARGUMENT

Almost sixty years ago, Justice Whittaker, writing for a unanimous Court in *Graham v. John*

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[2] So far as we know, no one contends that, once Alice's underlying concept is treated as prior art, the added limitations in Alice's claims are not conventional and routine, or that they are "enough" to make the claims as a whole non-obvious.

Deere Co., 383 U.S. 1, 18 (1966), pointed out the importance of a patentability test that not only the courts, but also the USPTO, could understand and apply:

> While we have focused attention on the appropriate standard to be applied by the courts, it must be remembered that the primary responsibility for sifting out unpatentable material lies in the Patent Office. To await litigation is, for all practical purposes, to debilitate the patent system.

The Federal Circuit's failure to articulate a coherent test has left the USPTO equally unable to perform that "primary responsibility." The USPTO guidance is as fractured as the Federal Circuit's decisions. Rather than providing an examiner a clear test, the Manual of Patent Examining Procedure (MPEP) provides a confusing array of quotes and hints with little explanation as to how an examiner should apply the requirement that a claim must be drawn to patent-eligible subject matter.

Examiners are directed to determine whether the claim "recites" any excluded subject, and to determine "if the judicially excepted subject matter has been practically applied in the product." (MPEP, Sec. 2106, p 2100.II.A). To "assist" them in doing so, the MPEP tells examiners that "a claim does not have to be novel or non-obvious to qualify as a subject matter eligible claim." *Id.* at pp 2100-20 and 21. The MPEP also dedicates ten pages to "Factors to Be Considered in an Abstract Idea Determination of a Method Claim," discussing patent eligibility. *See* http://search.uspto.gov/search?affiliate=web-sdmguspto.gov&query=mpep&go=Go, "Patent Subject Matter Eligibility").

The "factors" provide no real guidance. Examiners are told to "consider" at least four different "factors" (*Id.* at pp 2100-14 to -16), to "weigh" them keeping in mind that the "presence or absence of a single factor will not be determinative" (*Id.* at pp 2100-17), and then somehow to decide "if the factors indicate that the method claims is not merely covering an abstract idea." (*Id.* at pp 2100-18).

The Federal Circuit apparently recognized that its prior decisions did not provide the needed clarity and guidance to either the USPTO or the district courts. Accordingly, it ordered en banc review in *CLS Bank* to answer two questions. *CLS Bank v. Alice*, 484 F. App'x 559 (Fed. Cir. 2012). The first, and most important, was

> What test should the court adopt to determine whether a computer-implemented invention is a patent ineligible "abstract idea"; and when, if ever, does the presence of a computer in a claim lend patent eligibility to an otherwise patent-ineligible idea?[3]

---

[3] The second en banc question was directed to whether it mattered whether the invention was claimed as a method, system or storage medium, and whether the various forms of claims should be considered equivalent for § 101 purposes. Eight of the ten en banc judges concluded, in our view correctly, that the claims should rise and fall together regardless of claim type.

Unfortunately, the Federal Circuit proved itself unable to provide an answer. *CLS Bank v. Alice*, 717 F.3d 1269 (Fed. Cir. 2013). As Judge Newman said in her en banc opinion, *CLS Bank v. Alice*, 717 F.3d at 1321:

> The court, now rehearing this case en banc, hoped to ameliorate this uncertainty by providing objective standards for Section 101 patent-eligibility. Instead we have propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation.

Judge Moore agreed. *CLS Bank v. Alice*, 717 F.3d at 1314:

> Our court is irreconcilably fractured over these system claims and there are many similar cases pending before our court and the district courts.

From the Federal Circuit's recent decisions (*See e.g., CLS Bank*, 717 Fed.3d 1269 (2103), *Ultramercial*, 722 F.3d 1336 (Fed. Cir. 2013), and *Accenture*, 728 F. 3d 1335 (Fed Cir. 2013)), it appears that a majority, if not all, of the Federal Circuit judges agree that laws of nature, natural phenomena, abstract ideas and principles are not patentable, and that patents should not be allowed to preempt the basic tools of science and technological work. The Federal Circuit judges also appear to agree that it is important "to prevent the 'monopolization' of the 'basic tools of science and technological work,' which 'might tend to impede innovation more than it would tend to promote it." *CLS Bank*, 717 F.3d at 129. *See also CLS Bank*, 717 F.3d at 1276-1277, 1280-1281, and 1297; *Ultramercial*, 722 F.3d at 1341, 1345-1346; and *Accenture* 728 F. 3d at 1341.

But although the Federal Circuit agrees with these, it has not applied the fundamental "excluded subject matter must be treated as prior art" principle established in this Court's prior decisions. In *CLS Bank*, 717 F.3d at 1282, 1297, it said "We do not read the Court's occasional use of [the word 'inventiveness'] in the § 101 context as imposing that such limitations must necessarily exhibit 'inventiveness' in the same sense as that term more commonly applies to two of the statutory requirements for patentability, *i.e.*, novelty and nonobviousness," and that "any requirement for 'inventiveness' beyond Sections 102 and 103 is inconsistent with the language and intent of the Patent Act." *Id.* at 1297.

In *CLS Bank*, the Federal Circuit also misread this Court's guidance, saying "The Supreme Court's reference to 'inventiveness' in *Prometheus* must be read as shorthand for is inquiry into whether implementing the abstract idea in the context of the claimed invention inherently requires the recited steps." *CLS Bank*, 717 F.3d at 1303.

We submit that the Federal Circuit's characterization of this Court's precedent is incorrect. In *Mayo v. Prometheus*, this Court expressly noted that the "other steps in [Flook's] process . . . were all 'well known' to the point where, putting the formula to one side, there was no 'inventive concept' in the claimed application of the formula." *Mayo*, 132 S.Ct. at 1299. It also said that this Court's prior decisions both "warn us against interpreting patent statutes that make patent eligibility 'depend simply on the draftsman art' without reference to the 'principles underlying the prohibition against patents for [natural laws]" and "insist that a process that focuses upon the use of a natural law also contain other elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself." *Mayo*, 132 S.Ct. at 1294.

With respect to "inventive concept," this Court cited the pages of *Flook* (437 U.S. at 594) and *Bilski* (130 S. Ct. at 3230) that say "Respondent's process is unpatentable under § 101, not because it contains a mathematical algorithm as one component, but because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention." This is not "shorthand," but a mandate from this Court on how to determine whether a claim is patent-eligible.

Because the Federal Court has not required that a claim including "prior art" excluded subject matter must be non-obvious, the closest the Federal Circuit has come to articulating a "test" as to whether a claim is patent-eligible is to ask if added limitations to the claim are "meaningful" (*CLS Bank*, 717 F.3d at 1281, 1289) or ensure that the claim does not "pose . . . any risk of preempting an abstract idea." (*Accenture*, 728 F.3d at 1341) But neither of these provides anything approaching an objective standard for the USPTO, the lower courts or the Federal Circuit. Limitations are not objectively "meaningful" unless, as required by this Court, they are "enough" to make a claim as a whole non-obvious. Similarly, there can be no objective assurance that a claim will not "wholly pre-empt the mathematical formula and in practical effect . . . be a patent on the algorithm itself" (*Gottschalk*, 409 U.S. at 67) unless the claim is non-obvious and thus limited to what the patentee really contributed.

A test that does not require a USPTO Examiner or a court to ask whether a claim is novel and non-obvious, even when the underlying excluded subject matter is treated as prior art, does not satisfy this Court's requirements and is inevitably unworkable.

I. THIS COURT'S DECISIONS ARE CLEAR THAT "EXCLUDED" SUBJECT MATTER MUST BE TREATED AS PRIOR ART, WHETHER OR NOT PREVIOUSLY KNOWN.

For more than 160 years, this Court has consistently held that, in determining whether a claim is patentable, excluded subject matter is to be considered to be prior art, whether or not it was in fact previously known. In deciding whether a claim is patent-eligible under § 101, lower courts and the USPTO must treat excluded subject matter as prior art.

In *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854), this Court quoted at length from an English case, *Neilson v. Harford*, involving patent eligibility of claims directed to the principle that hot air would promote ignition of fuel better than cold, and to a device in which a heated receptacle was provided. This Court said that *Neilson* was "elaborately argued, and appears to have been carefully considered." *O'Reilly*, 56 U.S. at 114. According to this Court, *Neilson* explained that "a principle was not patentable" (*Id.* at 115), but that the "mechanical mode" that Neilson had invented, a "heated receptacle [interposed] between the blower and furnace [for] heating the air after it left the blower and before it was thrown into the furnace" (*Id.*, at 115), would support a patent.

This Court has approved and consistently applied this dichotomy between a principle and its application in its own subsequent decisions.

In *Funk*, 333 U.S. at 130, this Court accepted that the patentee had "discovered" that certain strains of bacteria could be mixed without inhibiting each other. But it nonetheless held that patent claims to a mixture of these bacteria did "not disclose an invention or discovery within the meaning of the patent statutes" because "once nature's secret of the non-inhibitive quality of certain strains . . . was discovered, the state of the art made the production of a mixed inoculant a simple step." *Id.* at 132. The only question left was whether the claims recited more than the discovery of "nature's secret." This Court answered that question in the negative:

> Even though [the discovery] may have been the product of skill, it certainly was not the product of invention . . . . There is no way in which we could call it such unless we

> borrowed invention from the discovery of the natural principle itself. *Id.*

In *Flook*, this Court again used the "discovery is prior art/obviousness" analysis to invalidate claims directed to a new mathematical algorithm. There, the patent claims were directed to an algorithm for calculating an alarm limit in a catalytic chemical conversion process. This Court first observed that "this case must also be considered as if the principle or mathematical formula were well known" (437 U.S. at 592); *i.e.*, that the first step in analyzing patent eligibility is to treat the law of nature as prior art. In particular, this Court said:

> [T]he process itself, not merely the mathematical algorithm, must be new and useful. Indeed, the novelty of the mathematical algorithm is not a determining factor at all. Whether the algorithm was in fact known or unknown at the time of the claimed invention, as one of the "basic tools of scientific and technological work," it is treated as though it were a familiar part of the prior art." (*Id.* at 591)

This Court then asked the critical question: was there anything in the claims beyond the algorithm that would impart patentability? This Court's answer was "no."

> Here it is absolutely clear that respondent's application contains no claim of patentable invention. The chemical processes involved in catalytic conversion of hydrocarbons are well known, as are the practice of

> monitoring the chemical process variables, the use of alarm limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for "automatic monitoring-alarming." (*Id.* at 594).

This Court assumed that the algorithm was both "novel and useful." *Id.* at 588. But this was irrelevant to whether the claim was patentable. The algorithm was prior art and could not be the basis for a patentable claim.

This Court's more recent decisions in *Bilski*, *Mayo*, and *Myriad* resolve any doubt that *Flook* means what it said: a mathematical formula or other excluded subject matter (*e.g.*, a natural phenomenon or law of nature) is treated as prior art, whether or not it was first discovered by the patentee.

In *Bilski*, 130 S. Ct. at 3230, this Court noted that it had "concluded that the process at issue [in *Flook*] was 'unpatentable under § 101, not because it contain[ed] a mathematical algorithm as one component, but because once that algorithm [wa]s assumed to be within the prior art, the application, considered as a whole, contain[ed] no patentable invention.'"

In *Mayo*, 132 S.Ct. at 1300, this Court again quoted, as it had in *Flook*, *Neilson*'s statement that "the case must be considered as if the principle [was] well known," and noted that *Neilson*'s "claimed process included not only a law of nature . . . but also several unconventional steps that confined the claims to a particular useful application of the principle." The Court observed that, in *Flook*,

> the use of alarm limits to trigger alarms, the notion that alarm limit values must be recomputed and readjusted, and the use of computers for "automatic monitoring-alarming" were all "well known," to the point where, putting the formula to the side, there was no "inventive concept" in the claimed application of the formula. (*Mayo*, 132 S.Ct. at 1299).

This Court in *Mayo* furthered observed that *Flook* had established the principle that "Purely 'conventional or obvious' '[pre]-solution activity' is normally not sufficient to transform an unpatentable law of nature into a patent-eligible application of such a law." *Id.* at 1298. In other words, once one assumes that a natural phenomenon or law of nature is prior art, then a claim can be patent-eligible only if the claim adds elements that make the claim novel and nonobvious.

In short, the Federal Circuit has not followed this Court's clear mandate to treat natural phenomena, laws of nature, and abstract ideas as prior art, and then to perform a standard obviousness analysis on the claim as a whole. We respectfully submit that this Court's prior decisions establish, and that the Federal Circuit, lower courts and USPTO should apply, the test proposed above.

II. A CLAIM INVOLVING EXCLUDED SUBJECT MATTER IS BARRED UNDER § 101 UNLESS THE CLAIM AS A WHOLE, TREATING THE EXCLUDED SUBJECT MATTER AS PRIOR ART, IS NON-OBVIOUS.

The United States Patent Laws have always required that a patent claim be "inventive." The current law is clear that a claim is not patentable "if the differences between the subject sought to be patented and the prior art are such that the subject matter as a whole would have been obvious." 35 U.S.C. § 103(a) Accordingly, again as this Court has consistently held for many years, claims (such as Alice's) that involve excluded subject matter (such as Alice's concept of reducing settlement risk) are not patentable unless the claim as a whole, treating the excluded subject matter as prior art, is non-obvious.

In the context of a claim involving excluded subject matter, this Court in *Funk*, *Flook*, *Bilski*, and *Mayo* has made clear that a claim must include elements that are not merely directed to the natural phenomena, law of nature, or abstract idea, but rather are "inventive"/ "non-obvious."

As already noted, this Court said that the claims in *Funk* were invalid because the claimed mixed inoculant was "a simple step . . . once nature's secret of the non-inhibitive quality of certain strains . . . was discovered." *Funk*, 333 U.S. at 132.

In *Flook*, 437 U.S. at 594, this Court said (emphasis added):

> Respondent's process is unpatentable under § 101 not because it contains a

> mathematical algorithm as one component, but because, once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention. Even though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented. Conversely, the discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application.

See also Bilski, 130 S.Ct. at 3230, and *Mayo*, 132 S.Ct. at 1294. In *Mayo*, this Court, citing both *Flook* and *Bilski*, said that its prior decisions "insist that a process that focuses upon the use of a natural law also contain other elements or a combination of elements, sometimes referred to as an 'inventive concept.' "

Rubber-Tip Pencil Co. v. Howard, 87 U.S. (20 Wall.) 498 (1874), *LeRoy*, *O'Reilly*, and, most recently, *Myriad* are also clear that a claim is valid only if taken as a whole it is non-obvious. In *Rubber-Tip*, this Court asked (87 U.S. at 507)

> What, therefore, is left for this patentee but the idea that if a pencil is inserted into a cavity in a piece of rubber smaller than itself the rubber will attach itself to the pencil, and when so attached become convenient for use as an eraser?

This Court's answer was "nothing." Although the combination with a pencil might have been "nonobvious" or an "invention," the idea alone was not (*Id.*):

> An idea of itself is not patentable, but a new device by which it may be made practically useful is. The idea of this patentee was a good one, but his device to give it effect, though useful, was not new. Consequently he took nothing by his patent.

In *O'Reilly*, this Court found that "Morse was the first and original inventor of the telegraph described in his specification" (56 U.S. 108), that "and for the method or process thus discovered, he is entitled to a patent." (56 U.S. 117) But this Court was also clear the Morse was not entitled to his famous eighth claim because "he has not discovered that the electro-magnetic current, used as motive power, in any other method, and with any other combination, will do as well." *Id.*

In finding that Morse's patent had to be limited to what he had actually invented, this Court quoted the portion of the English Court of Exchequer's opinion in *Neilson* that more than a principle was required for a patent to be valid (*Id.*, at 116):

> [T]he patent was not supported because this principle was embodied in it. . . . But his patent was supported because he had invented a mechanical apparatus by which a current of hot air, instead of cold, could be thrown in. And this new method was protected by his patent. The interposition of a heated receptacle in any form was the novelty he invented.

The Court then proceeded to "*Leroy et al. v. Tatham* and others, decided at the last term, 14 *Howard*, 156," noting that in *Leroy* "the court held that [Leroy] was not entitled to a patent for this newly-discovered principle or quality in lead; and that such a discovery was not patentable. *See Leroy* et al., 14 Howard at 156. But that he was entitled to a patent for the new process or method in the art of making lead pipe." *See id.* [4]

Finally, this Court said that Myriad "could possibly have sought a method patent" on a method of isolating the naturally occurring BRCA1 and BRCA2 genes that it had discovered. But it also said that such an effort probably would have been unsuccessful.

> Had Myriad created an innovative method of manipulating genes while searching for the BRCA1 and BRCA2 genes, it could possibly have sought a method patent. But the processes used by Myriad to isolate DNA were well understood by geneticists at the time of Myriad's patents "were well understood, widely used, and fairly uniform insofar as any scientist engaged in the

---

[4] One further point should be noted with respect to *Leroy*. The dissent there proposed that, if a person discovered a new principle, that principle alone was enough for the patent to be val*id*. (*Leroy*, 55 U.S. at 186-187). The majority in *Leroy* did not accept the dissent's proposition that one who discovers a law of nature or the like is entitled to a patent that covers every use of that principle. To our knowledge, no subsequent decision of this Court has done so either.

> search for a gene would likely have utilized a similar approach." 702 F. Supp.2d at 202-203. (*Myriad*, 133 S.Ct. at 2019-2020)

As for Myriad's cDNA claims, the Court said that they were patent-eligible because cDNA "is not a product of nature." This Court, however, "express[ed] no opinion whether cDNA satisfies the other statutory requirements of patentability." (*Id.* at 2020).

In sum, this Court has consistently and repeatedly said that a claim involving excluded subject matter is barred under § 101 unless the claim as a whole is nonobvious when laws of nature, natural phenomenon, and abstract ideas are treated as prior art. This test is simple and straightforward. It provides patentees, the lower courts, and the public with clear guidelines as to what is and is not patent-eligible subject matter, and it allows the USPTO to apply the requirements of Section 101 across all technologies and to all types of patent claims.

III. THE FEDERAL CIRCUIT HAS NOT PROVIDED A CONSISTENT APPROACH TO DETERMINING WHETHER A CLAIM IS PATENT-ELIGIBLE.

At least since its decision in *Gottschalk v. Benson*, 409 U.S. 63 (1972), this Court has been clear that a patent must not, as a practical matter, effectively preempt use of a law of nature, natural phenomena, abstract idea or a principle. *See, e.g.*, *Gottschalk*, 409 U.S. at 71: "It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case." To avoid preemption, this Court has made clear that a claim must be limited to what the patentee actually invented above and beyond the "prior art" excluded subject matter itself.

The Federal Circuit, however, has not followed. Instead, the Federal Circuit has moved from one flawed analytical methodology to another. In *Bilski*, the Federal Circuit set forth the "machine-or-transformation" as the sole test; this Court observed the Federal Circuit's rule "violates . . . statutory interpretation principles" (*Bilski*, 130 S.Ct. at 3226), and that as the sole test it would "risk obscuring the larger object of securing patents for valuable inventions without transgressing the public domain." *Bilski*, 130 S.Ct. at 3227. After its first decision in *Myriad* was remanded by this Court, the Federal Circuit again found claims to isolated DNA patentable on the ground that isolated DNA "is a tangible, man-made composition of matter defined and distinguished by its objectively discernible chemical structure." *Assoc. Molecular Pathology v. Myriad Genetics, Inc.*, 689 F.3d 1303 (2012). This Court disagreed.

Now, in *CLS Bank*, the Federal Circuit propounds three different tests for determining patent eligibility. *CLS Bank*, 717 F.3d at 1321.

Test 1. Judge Lourie's opinion said that a court must "look for meaningful limitations that prevent the claim as a whole from covering the concept's every practical application." *CLS Bank*, 717 F.3d at 1281.

Test 2. Judge Newman would eliminate any inquiry into patent eligibility under Section 101 altogether and focus on patentability under Sections 102, 103, and 112. See *id.* at 1326.

Test 3. Judge Rader asserted that the inquiry should focus on "whether the claims tie the otherwise abstract idea to a specific way of doing something with a computer, or a specific computer for doing something;" but that test appears inconsistent with this Court's holdings in, for example, *Diehr* (450 U.S at 191–192: "[T]he prohibition against patenting abstract ideas' cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." and *Gottschalk*, whose "method of converting signals from binary coded decimal form into binary," a method this Court found invalid because it effectively patented an idea, required a very "specific way of doing something with a computer." *Id.* at 1302.

Unfortunately, Judge Moore's statement that "our court is irrevocably fractured" (*CLS Bank v. Alice*, 717 F.3d at 1314), and Judge Newman's that the Federal Circuit has "propounded at least three incompatible standards, devoid of consensus, serving simply to add to the unreliability and cost of the system of patents as an incentive for innovation" (*CLS Bank v. Alice*, 717 F.3d at 1342), could not be more correct.

◆

CONCLUSION

The Federal Circuit's inability to provide a consistent or workable standard lays an unacceptable burden on it, lower courts, the USPTO, patentees, and the public. All need clarity on what claims are patent-eligible. Without clarity that only this Court can provide, patentees may place substantial investment into patents of questionable validity, while the public cannot know either what it can do, or what it cannot.

This uncertainty is all the more troubling because it is entirely avoidable. The crux of this Court's "patentable subject matter" decisions is that Section 101 requires that excluded subject matter be treated as prior art. This resulting test that the Court has provided is straightforward, is one that the USPTO and the courts have regularly applied, and can be applied across all technologies and to all claims.

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ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, ET AL.,

Respondents.

◆

**On Writ Of Certiorari To The
United States Court Of Appeals
For The Federal Circuit**

◆

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INTEREST OF *AMICI CURIAE*

Amici are professors and scholars who teach and write on legal and economic issues and are concerned about the role of patent law in promoting technological innovation. They are Timothy K. Armstrong, James E. Bessen, Michele Boldrin, Irene Calboli, Brian W. Carver, Ralph D. Clifford, Wesley M. Cohen, Eric Goldman, Brad A. Greenberg, Bronwyn H. Hall, Christian Helmers, Karim R. Lakhani, David K. Levine, Brian J. Love, Eric S. Maskin, Michael J. Meurer, Shawn P. Miller, Connie Davis Nichols, Tyler T. Ochoa, Jorge R. Roig, Matthew Sag, F. M. Scherer, Jason M. Schultz, Katherine J. Strandberg, Alexander Tabarrok, and Eric von Hippel. Various *amici* have taught, researched, and published analyses on the role of patent law as an incentive to inventors and entrepreneurs. A summary of the qualifications and affiliations of the individual *amici* is provided at the end of this brief, though it should be noted that *amici* file this brief solely as individuals and not on behalf of the institutions with which they are affiliated. *Amici* represent neither party in this action and offer the following views on this matter.[1]

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[1] In accordance with S. Ct. R. 37.3(a), all parties have consented to the filing of this brief. The Petitioner and Respondents have filed consent letters with the Clerk. Pursuant to S. Ct. R. 37.6, counsel for *amici* state that no counsel for a party authored this brief in whole or in part, and no person or entity other than *amici* or their counsel made a monetary contribution to the preparation or submission of this brief.

SUMMARY OF ARGUMENT

The Federal Circuit's expansion of patentable subject matter in the 1990s led to a threefold increase in software patents, many of which contain abstract ideas merely tethered to a general-purpose computer. There is little evidence, however, to suggest this expansion has produced an increase in software innovation. The software industry was highly innovative in the decade immediately prior to this expansion, when the viability of software patentability was unclear and software patents were few. When surveyed, most software developers oppose software patenting, and, in practice, software innovators tend to rely on other tools to capture market share such as first-mover advantage, trade secrecy, copyright, goodwill, and economic network effects. If anything, the increase in software patenting has led to an increase in software litigation, which in turn has encouraged firms to acquire patents for strategic purposes unrelated to innovation, serving as either defensive stockpiles to deter legal threats or offensive leverage for rent-seeking patent assertion entities (PAEs).

Moreover, abstract software patents do not function well within a property rights framework because they fail to define cognizable metes and bounds and fail to provide effective notice to third parties of when a particular practice or product might infringe. Due to their abstractness, these claims can often be construed to cover any of the particularized processes that result in the same outcome, *including those never envisioned by the inventor*. Accordingly, these metes and bounds are not concrete enough to be useful to those who wish to tread carefully around them. The mere application of the idea using general-purpose technological components, such as a general-purpose computer, does nothing to abate this problem. Similarly, abstract patents defy the attempts of software innovators, or general counsel at technology companies, to stay on notice of what is already protected. This leaves firms vulnerable to investing in software development with little to no assurance that they will be able to avoid infringing upon an abstract patent, even if they conduct diligent searches within patent databases. Again, this will be true even if there are general-purpose technological components tethered to the claims, as those components do nothing to help distinguish one abstract claim from another. Proliferation of such patents also contributes to the problem of patent thickets.

A well-defined 35 U.S.C. § 101 ensures that abstract software patent claims and their attendant notice and patent thicket problems do not undermine the patent system and stymie innovation. It serves as a decisive gatekeeper that the Patent Office and trial courts can use early in administrative proceedings and litigation. Further, it avoids many of the systemic challenges prevalent with the use of 35 U.S.C. §§ 102, 103, and 112 in such cases – the speed of software innovation, the difficulty locating software prior art, and lax, broad claiming standards. Accordingly, this Court should affirm the invalidity of the patent claims at issue here and hold that abstract ideas in the form of software are unpatentable and that mere computer implementation of those ideas does not create patentability.

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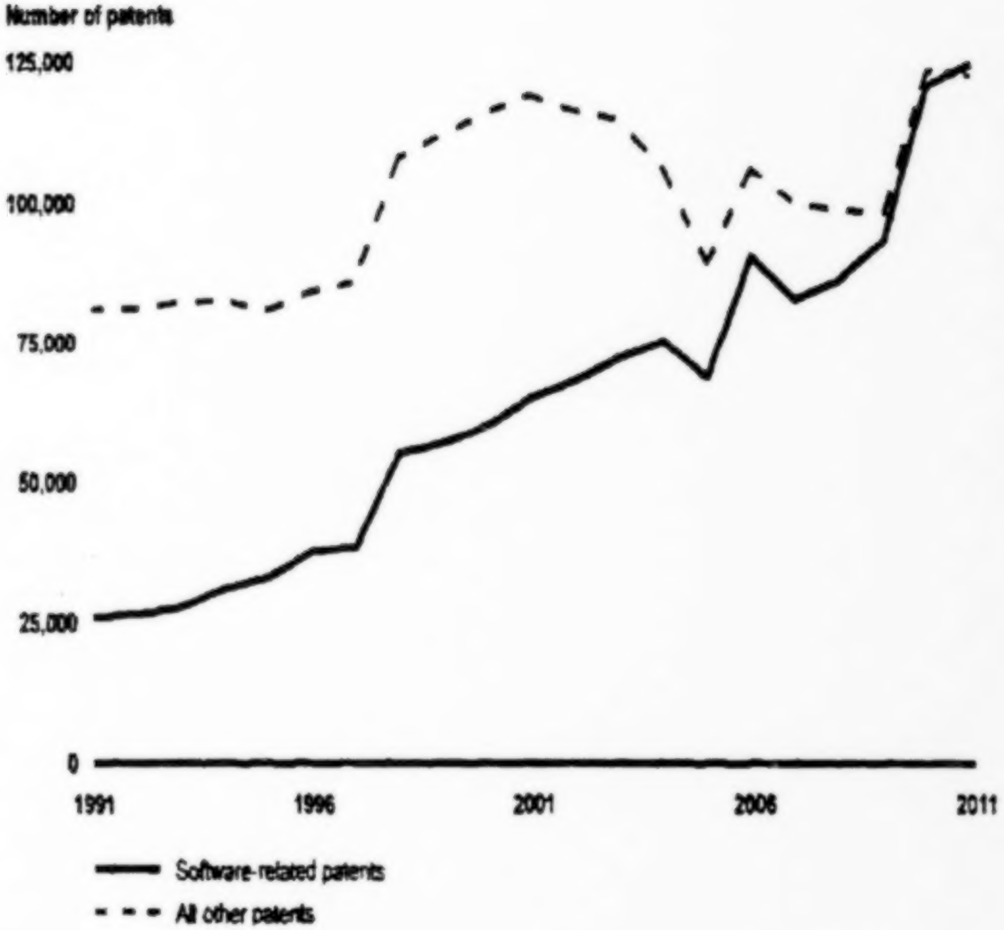
ARGUMENT

The Constitution empowers Congress to create a patent system granting exclusive rights to inventors, but only as a means of encouraging innovation. *See* U.S. Const. art. I, § 8, cl. 8. This Court's jurisprudence has consistently recognized that extending patent protection to abstract ideas not only fails to increase innovation overall, but threatens to impede its progress. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012) ("[M]onopolization of [abstract ideas] through the grant of a patent might tend to impede innovation more than it would tend to promote it."); *Bilski v. Kappos*, 130 S. Ct. 3218, 3229 (2010). Nonetheless, the U.S. Court of Appeals for the Federal Circuit has gradually expanded the scope of patentable subject matter for abstract ideas over the last quarter century, culminating with its holdings in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994) and *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998). As a result of this misguided expansion, the patent system has become increasingly unbalanced and even hostile in some respects to high technology entrepreneurs and inventors. This case presents the Court with an opportunity to expand on its efforts in *Bilski* and *Mayo* to restore balance by reaffirming the abstract idea exclusion as a robust gatekeeper that prohibits abstract patent claims, such as those asserted in this case, no matter the form in which their drafters attempt to claim them. *Amici* present this brief and the empirical evidence within it in support of such an opinion.

I. Abstract Software Patents Discourage Innovation.

In *Gottschalk v. Benson*, 409 U.S. 63 (1972) as well as *Parker v. Flook*, 437 U.S. 584 (1978), this Court recognized the risks of allowing patents on the abstract formulas and concepts contained in software even when they were tied tangentially to a physical apparatus. *Flook*, 437 U.S. at 590 (extending this principle by holding that post-solution activity does not "transform an unpatentable principle into a patentable process," otherwise any "competent draftsman could attach some form of post-solution activity to almost any mathematical formula."); *Benson*, 409 U.S. at 68 (invalidating claims for being "so abstract and sweeping as to cover both known and unknown uses" of a method of numerical conversion on a general-purpose computer). When this Court did find such a patent valid in *Diamond v. Diehr*, 450 U.S. 175 (1981), its holding was limited to the application of a formula in a specific industrial process. *Id.* at 192. Unfortunately the Federal Circuit misunderstood this delicate analysis and increasingly expanded the scope of patentable subject matter, culminating with its decisions in *Alappat* and *State Street*, allowing otherwise abstract patent claims to qualify under § 101 based on a mechanical "magic words" approach. *State Street*, 149 F.3d at 1375 (requiring that an abstract software claim merely produce a "useful, concrete and tangible result"); *Alappat*, 33 F.3d at 1545 (holding that a software program based on an abstract idea was patentable as long as the claim included a general-purpose computer).

This expansion has contributed to a dramatic increase in the number of patents related to software, both in absolute terms and as a percentage of issued patents. *See* U.S. Gov't Accountability Office, GAO-13-465, *Intellectual Property: Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality* 13 (2013), *available at* http://1.usa.gov/1gatCRr (noting that after *Alappat* and *State Street*, there was a substantial increase in the number of patents granted with software claims). The following chart demonstrates this increase:



Id. at 12. Take, for example, the estimated 11,000 patents covering the sale of goods online. James Bessen & Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk* 213 (2008). These patents emerged, at least in part, because otherwise unpatentable abstract ideas – e.g., holding desired products in a shopping cart, checking out upon shopping completion, pressing a button to "buy it now" – became the patentable inventions of the first patent applicant to suggest implementing the idea on a computer. *Cf. Alappat*, 33 F.3d at 1545.

A. Abstract Software Patents Should Be Limited, as There Is Little Evidence that Software Innovators Rely on Patenting for Incentives to Innovate and Compete.

Despite the expanded availability of patent protection, studies of the software industry have failed to show any corresponding increase in innovation as a result. While the number of software patents has increased, there is evidence that software entrepreneurs rely much less on patent incentives when building and maintaining competitive businesses than other factors, such as first mover advantage and trade secret, copyright, or trademark protection. *See* Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 Berkeley Tech. L.J. 1255, 1288-90 (2009). In fact, studies suggest that spending on stronger and broader software patents is *negatively* correlated with spending on R&D. *See* Robert Hunt & James Bessen, *The Software Patent Experiment*, 77(3) Fed. Res. Bank Phila. Bus. Rev. 22, 27-29 (2004) ("[T]he negative correlation between increases in firms' focus on software patents and their R&D intensity in the 1990s suggests that firms may be substituting for R&D with software patents."); *see also* James Bessen

& Robert M. Hunt, *An Empirical Look at Software Patents* 30-33 (Fed. Reserve Bank of Phila. Working Paper No. 03-17, 2004) (reporting the results of a historical study showing that in the 1990s firms increased their propensity to patent after subject matter restrictions on software patents were relaxed, and that this increase in spending on patents displaced spending on R&D to such an extent that, assuming perfect substitution, R&D would have been about 10%, or $16 billion, higher if there had been no increase in software patenting).

History also suggests that patent incentives have had a negligible impact on software development overall. Despite the denial of software patentability in *Benson* and *Flook*, which rejected broad-based abstract claims, or after *Diehr*, which only allowed patentability involving software in a very narrow concrete context, software innovation flourished in the period between *Benson* and *Alappat*. *See* Martin Campbell-Kelly, *From Airline Reservations to Sonic the Hedgehog: A History of the Software Industry* 18-19 tbl.1.2 (2003) (noting that the software industry grew eightfold between 1980 and 1990, with revenues increasing from $6.1 billion to $51.3 billion). In addition, surveys of software developers during this period show most were, in fact, *opposed* to patents. *See, e.g.*, Effy Oz, *Acceptable Protection of Software Intellectual Property: A Survey of Software Developers and Lawyers,* 34 Info. & Mgmt. 161, 167-70 (1998); Pamela Samuelson et al., *Developments on the Intellectual Property Front*, 35(6) Comms. of the ACM 33, 35 (1992); Bessen & Meurer, *Patent Failure*, *supra*, at 189 ("[S]uch broad opposition from *within* the affected industry and among the affected inventors seems to be unprecedented in U.S. patent history."). And, despite the fact that software patents have been growing both in absolute terms and as a percentage of all patents granted in recent decades, most software firms still do not patent their software products. James Bessen, *A Generation of Software Patents*, 18 B.U. J. Sci. & Tech. L. 241, 255 (2012). This appears to be even more true for startup firms. *Id.* at 255-56.

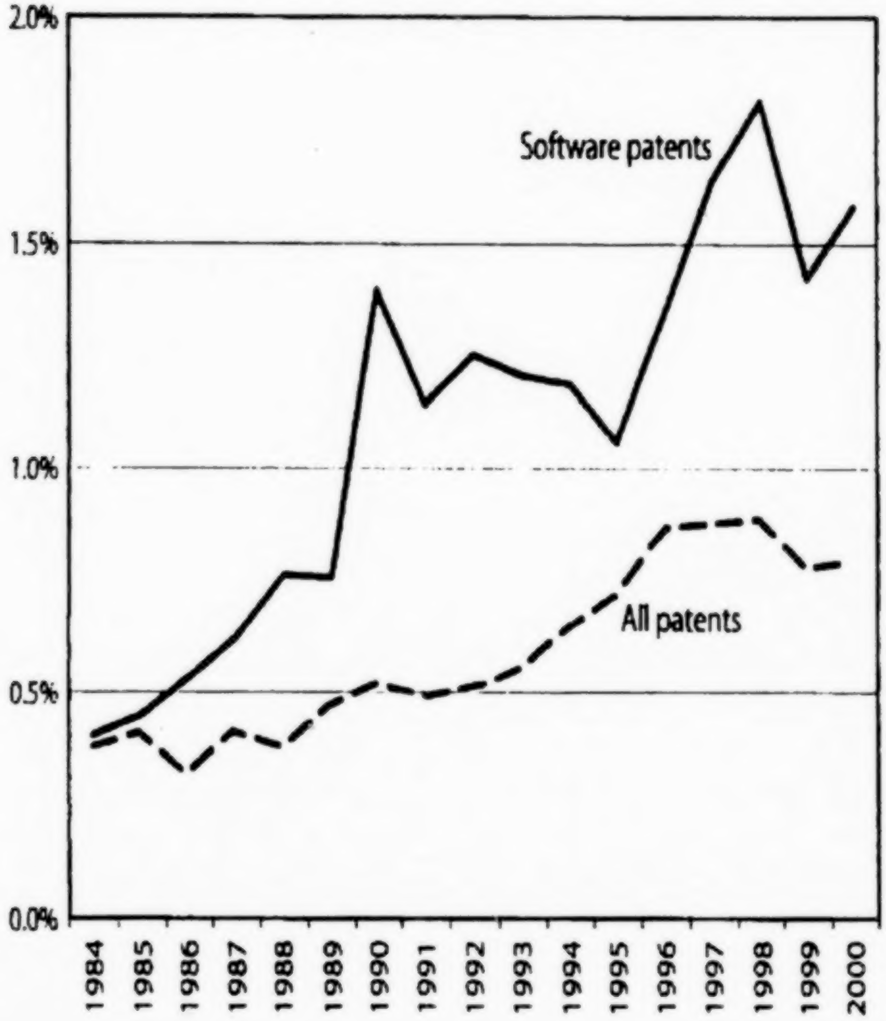
Indeed, practically speaking, it is unlikely that patent rights can spur innovation in software because:

> [I]nnovation in the high-tech industry is exceedingly fast, while government bureaucracy is exceedingly slow. Computing power doubles roughly every two years, but it generally takes three to four years to receive a patent, and even longer to enforce it in court. As a result, patented inventions in the high-tech sector are invariably yesterday's news.

Brian J. Love, *No: Software Patents Don't Spur Innovation, but Impede It*, Wall St. J., May 12, 2013, at R2.

B. The Need for Socially Wasteful Defensive Bulwarks Has Primarily Driven Software Patenting Since *Alappat* and *State Street*, Rather than the Desire to Protect Investments in R&D or to Promote Competition.

While there is little evidence that expanded software patent eligibility has spurred innovation, it is increasingly apparent that it has spurred patent litigation. *See* Bessen, *supra*, at 261 ("[T]he number of lawsuits involving software patents has more than tripled since 1999."); Bessen & Meurer, *Patent Failure*, *supra*, at 193 ("Software patents issued in more recent years are much more likely to be litigated, not less."). This increase is not merely in proportion to the growing number of software patents; the probability that any single software patent will result in litigation has also been rising over time, meaning that both defendants and software patentees face a higher risk of litigation and business uncertainty. The following chart demonstrates this:



Probability that a Patent Is in Lawsuit Within Four Years of Issue

Note: Data adjusted for under-reporting.

Bessen & Meurer, *Patent Failure*, *supra*, at 193, fig.9.2. The increase in software patent litigation is such that the GAO reports that the increase in overall patent litigation is largely attributable to the growth of litigation over software patents. U.S. Gov't Accountability Office, *supra*, at 14.

Ironically the increase in litigation has led many operating software companies to obtain patents to fend off suits, rather than to file them. *See* Colleen V. Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, 62 Hastings L.J. 297, 306-10 (2010) (describing the practice of defensive patenting by high-tech firms as growing rapidly after the late 1990s); Jonathan Masur, *Costly Screens and Patent Examination*, 2 J. Legal Analysis 687, 704-14 (2010) (explaining how patents with high private value – defined as the value of a patent as a tool for initiating or deterring litigation – often fail to generate socially beneficial research); Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. Pa. L. Rev. 1, 26 (2005) (discussing how patents can be more valuable to companies in aggregate as a defensive portfolio than individually as reward mechanisms). In this context, patents no longer function to reward innovation: they are merely an added cost of doing business, an insurance policy against litigation as opposed to a reward for productive R&D. For larger firms this practice of amassing stockpiles of broad patents has amounted to a Cold War-era arms race that produces costly deterrence through an implied threat of mutually assured destruction by litigation. *See generally* Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, *supra*, at 333-34; Colleen V. Chien, *Race to the Bottom*, 51 Intell. Asset Mgmt. Mag. 10 (2012). The costs of this practice are incurred on multiple levels: first, the cost to the firm and its shareholders of acquiring the defensive patent; second, the cost of defending against a software patent lawsuit; and third, the cost to society that occurs when innovation is chilled or firms are deterred from entering a market. Some large technology companies have devoted billions of dollars to building their patent portfolios, spending more on strategic patent acquisitions and litigation than on overall R&D. *See* Charles Duhigg & Steve Lohr, *The Patent, Used as a Sword*, N.Y. Times (Feb. 25, 8:14 PM), http://nyti.ms/N0Ba0T; *see also* Steven Church, Tim Culpan & Devin Banerjee, *Apple Joins Microsoft, RIM in $4.5 Billion Buy of Nortel Patents*, Bloomberg (July 1, 2011, 12:18 PM), http://bloom.bg/1aLJegC; James Kendrick, *Google Buys Motorola Mobility and Its Patent Portfolio for $12.5 Billion*, ZDNet (Aug. 15, 2011 5:27 PM), http://zd.net/1iE21KY.

C. The Explosion of Patent Assertion Entity Activity Has Aggravated the Costs of Abstract Software Claims.

A significant contributor to the rise in software patent litigation is the rise of patent assertion entities (PAEs).[2] PAEs are firms that obtain patents without intent to support or develop new products; instead, their business model is based on threatening costly litigation against practicing firms to extract settlements and licensing fees. Exec. Office of the President, *Patent Assertion and U.S. Innovation* 1 (2013), http://1.usa.gov/1oExPD1. The fact that PAEs do not actually use the patents they own outside of litigation effectively immunizes them from counter-claiming and the defensive patent strategies discussed above. *Id.* at 4. In 2013 the White House released a report by the President's Council of Economic Advisers, the National Economic Council, and the Office of Science & Technology Policy that concluded on the basis of an extensive review of empirical studies that PAEs have had an overall negative impact on innovation and economic growth. *Id* at 2.[3] A recent study further suggests that the burden imposed by PAEs is disproportionately borne by small and medium sized firms who are more likely to be threatened with litigation by PAEs than large firms.

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[2] Patent assertion entities are sometimes called non-practicing entities (NPEs) or patent trolls, though in the cited studies both refer to the same type of firm.

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[3] As a general matter PAEs follow three different strategic approaches when extracting rents: 1) a "lottery ticket" model where PAEs acquire broad, abstract patents in the hopes of obtaining outsized jury awards, 2) a "bottom-feeder" model where the PAEs actually avoid litigation, relying instead on the general high cost of patent litigation to obtain many small settlement agreements, or 3) building massive portfolios of patents to extort licensing fees from practicing firms. *See* Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 Colum. L. Rev. 2117, 2126-28 (2013). The latter two strategies are much less likely to result in litigation than the lottery ticket model, so PAEs in such cases have little incentive to care about the quality of the patents they obtain. *Id.*

James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes,* 99 Cornell L. Rev. 387, 398-99 (2014) (reporting survey results that firms with less than $1 billion in annual revenues made up 90% of the sampled defendants in PAE lawsuits between 2005-2011, and firms with less than $100 million in revenues made up 82% of all defendants, despite the fact that these small and medium sized firms only made up 44% of the overall survey sample).

PAEs are particularly relevant to the software industry because the bulk of PAE litigation involves software patent claims, which are particularly susceptible to abstraction problems. *See* James Bessen, Jennifer Ford & Michael J. Meurer, *The Private and Social Costs of Patent Trolls*, 34(4) Regulation Mag. 26, 29 (2011-2012) (reporting empirical study findings that 62% of patents litigated by PAEs between 1990 and 2010 were "software patents" and 75% covered "computer and communications technology"); *see also* Brian J. Love, *An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls Without Harming Innovators?*, 161 U. Pa. L. Rev. 1309, 1347 (2013) (finding that roughly 80% of PAE lawsuits were brought to enforce claims with high-tech subject matter, 65% of which were software-related claims); U.S. Gov't Accountability Office, *supra*, at 22 ("Specifically, about 84 percent of [PAE] lawsuits from 2007 to 2011 involved software-related patents, while about 35 percent of operating company lawsuits did."). PAE activity has increased so rapidly that in 2012 over half of all patent litigation cases could be attributed to PAEs. Exec. Office of the

President, *supra*, at 5. It is estimated that companies spent approximately $29 billion in 2011 dealing with these lawsuits. *See* Bessen & Meurer, *The Direct Costs from NPE Disputes*, *supra*, at 389. Apple, Samsung, HP, AT&T, Dell, Google, and Amazon.com were each sued by PAEs thirty or more times in 2013 alone. *Most Pursued Companies*, PatentFreedom, http://bit.ly/M5egUQ (last visited Feb. 23, 2014).

D. A Robust Application of § 101's Abstract Idea Prohibition Restores the Balance that *Alappat* and *State Street* Disrupted.

This Court has stated repeatedly that the prohibition on the patenting of abstract ideas is central to maintaining a proper balance in the patent system. *Mayo*, 132 S. Ct. at 1301 ("The Court has repeatedly emphasized . . . a concern that patent law not inhibit further discovery by improperly tying up the future use of laws of nature."); *Benson*, 409 U.S. at 67 ("Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work."). The Court has an opportunity to return patent law to the course it established in *Benson*, *Flook*, and *Diehr*, and further reaffirmed in *Bilski* and *Mayo*, by ensuring that § 101 provides a robust gatekeeping function to prohibit abstract software claims, including those whose only tether to physical reality is the computer itself or other similar general-purpose technological devices. *Bilski*, 130 S. Ct. at 3230.

Opponents to this Court's position in *Bilski* and *Mayo* often claim that such holdings harm companies who have spent substantial amounts of money relying on the Federal Circuit's holdings in *Alappat* and *State Street*. Such claims, however, are misguided. Given the evidence above, the large amount of money invested in software patents has not led to more innovation and sales growth; instead, they have been a part of the costly practice of building defensive patent portfolios to stave off litigation and have even come back to penalize software firms through greater PAE activity. A robust § 101 gatekeeper would mitigate these costs and free software firms' capital from defensive patent stockpiling, making it available for productive and innovative R&D. This would further diminish the problem of patent thickets (discussed *infra*, §II(C)), ultimately increasing competition in the software industry and lowering cost of entry for innovative new startup companies. *See* Iain M. Cockburn & Megan J. MacGarvie, *Entry and Patenting in the Software Industry,* 57 Mgmt. Sci. 915, 926-29 (2011).

II. Section 101 Ensures the Patent System Operates as an Efficient Property Rights System.

In addition to skewing incentives and increasing socially wasteful spending, abstract software patents have undermined the patent system's ability to function as an efficient property rights system because they (1) fail to define clear metes and bounds for claims, (2) fail to provide effective public notice to avoid inadvertent infringement, and (3) contribute to troublesome patent thickets.

A. Abstract Software Patents Fail to Define Clear Metes and Bounds.

Unlike the physical landscape, the "patentscape" lacks unique and recognizable geological features to serve as common points of reference when describing the shape and size of an entitlement. The metes and bounds of a patent must, therefore, be interpreted by mapping the words in a claim to a range of technologies that are sufficiently analogous to the invention actually possessed by the inventor. An abstract claim, however, fails to provide these metes and bounds, not because it is too broad, but because it "claims technologies unknown to the inventor." Bessen & Meurer, *Patent Failure*, *supra*, at 199. When an activity is described in an abstract manner – e.g. "the art of cutting ice by means of any power other than human power," *Wyeth v. Stone*, 30 F. Cas. 723, 727 (C.C.D. Mass. 1840) – the limits of the claim cease to be cognizable as some range of extant technologies. Thus, although the ice-cutter's patent was granted in the 1840s, there is no sensible mode of interpreting the boundaries of the claim that wouldn't extend to ice-cutting by laser, robot, or genetically modified polar bear. As Justice Story argued, "No man can have a right to cut ice by all means or methods, or by all or any sort of apparatus, although he is not the inventor of any or all of such means, methods, or apparatus." *Id.*

Biological or chemical inventions will, at the very least, have a unique formula or compound molecule to serve as a point of reference. Software, on the other hand, may be capable only of functional, result-oriented definitions – e.g., cutting ice – which are amenable to broad interpretations that transcend the actual technologies originally known to the inventor. *See generally* Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905. Three examples, each litigated after *Alappat*, illustrate this interpretive ease. U.S. Patent No. 4,528,643, commonly known as "the Freeny patent," was granted for a vending machine that produced digital music tapes in stores, but the claim was cunningly drafted to be extremely comprehensive: a "system for reproducing information in material objects at a point of sale location." Freeny filed his application well before the advent of personal computers, e-commerce, and portable media players. Nonetheless, the company that came to hold the patent, E-DATA, alleged that purchasing, downloading, and transferring music from home computers onto media players or CD-ROMs were all within the patent's scope. *See Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323 (Fed. Cir. 2001). Similarly Wang Labs developed and patented an early operating system whose graphical user interface displayed information in "frames." Wang sued Netscape and America Online because these services also displayed information inside of "frames," a feature those programs share with almost all modern user interfaces. *Wang Labs., Inc. v. Am. Online, Inc.*, 197 F.3d 1377 (Fed. Cir. 1999). Finally, in 2003, a PAE, Pinpoint, sued Amazon alleging that by recommending books to users, Amazon had infringed a patent on "systems recommending TV programs to viewers based on past choices." *Pinpoint, Inc. v. Amazon.com, Inc.*, 369 F. Supp. 2d 995 (N.D. Ill. 2005).

Such abstract claims as "displaying data in frames," "recommending media based on past choices," "reproducing information in material objects at a point of sale," or, as in the present case, using "a third party . . . to eliminate 'counterparty' or 'settlement' risk," simply cannot be reliably construed to define a reasonable area of covered technology. *See Wang*, 197 F.3d at 1379; *Interactive Gift*, 256 F.3d at 1323; *Pinpoint*, 369 F. Supp. 2d at 995; *cf. CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1274 (Fed. Cir. 2013). A general counsel at a technology startup would be hard-pressed to describe any concrete bounds or permissible follow-on innovations to her fellow engineers in the face of such claims. Any software that resulted in a similar functional result could be construed as infringing, and any investment in the commercialization of those technologies could inevitably carry liabilities, risks, and costs whose magnitudes are impossible to predict in advance. Thus, the property system that ostensibly exists to assure investors that long-term rents are secure does the very opposite, casting a pall of uncertainty over the viability of any commercial product that happens to be adjacent to a lurking abstract claim.

B. Abstract Software Patents Fail to Provide Effective Public Notice.

Like metes and bounds, notice is also a concept the patent system borrows from traditional property law. Bessen & Meurer, *Patent Failure*, *supra*, at 206-07. The concepts are linked in so much as uncertainty surrounding borders often makes it impossible for citizens to be *on notice* and effectively plan their behavior with regards to navigating those borders or developing the immediately adjacent properties. Under patent law a citizen may fail to have notice of a claim not merely because the borders of the claim were difficult to discern, but because the claim as a whole was never imagined to be the stuff of patents. Such is the plight of a technology firm's general counsel who belatedly discovers that there are abstract claims that actually apply to longstanding industry conventions, "the basic tools of scientific and technological work." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972). This was surely the rude awakening suffered by counsel at Netscape and America Online when their companies were accused of infringing a decade-old patent on "displaying information in frames," despite the ubiquitous and unlicensed use of "frames" – windows or boxes – in software design. *Wang*, 197 F.3d at 1381. When sizable investments in product design, manufacture, and marketing are made well before notice of a relevant abstract patent arrives, the inadvertently infringing manufacturer is in an extremely weak negotiating position. The patent holder can seek exorbitant royalties under credible threat of shutting down the manufacturer and rendering their prior efforts into fruitless sunk costs. *See* Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting, in* 1 *Innovation Policy and the Economy* 119, 125 (Adam B. Jaffe et al. eds., 2001).

Of course, one might argue that the job of a general counsel is to stay *on notice,* and so we may feel little pity for her failures. Perhaps she should have spent more time searching patent databases or monitoring the Patent & Trademark Office's (PTO) weekly publications for relevant claims. However these searches have costs, and if these search costs are too onerous, productive activity will quickly cease. The costs of staying on notice in the software patent system are very large because of the staggering number of patents to discover and read. *See* Bessen & Meurer, *Patent Failure*, *supra*, at 213 ("David M. Martin has estimated that 'if you're selling online, at the most recent count there are 4,319 patents you could be violating. If you also planned to advertise, receive payments for or plan shipments of your goods, you would need to be concerned with approximately 11,000.' "). Further, the cost in work hours of running the search can be extremely high. *See id.* ("One software executive estimates that checking clearance costs about $5,000 per patent."); Christina Mulligan

& Timothy B. Lee, *Scaling the Patent System*, 68 N.Y.U. Ann. Surv. Am. L. 289, 311-12 (2012) ("The more abstract an invention is, the more different parties are likely to use it for different purposes, and the more flexibility parties will have to describe it. All of these factors mean that more abstract patents will produce particularly high discovery costs."). If 11,000 patents need to be searched to engage in e-commerce while remaining on notice, and each patent will require a $5,000 investment in time and resources, then the careful software startup will be spending $55 million in capital before they can even begin to operate. Good news for lawyers, perhaps, though certainly not for in-house counsel, engineers, and others who depend on notice to ensure freedom to operate and innovate in new technologies.

Strategic PAE behavior also significantly increases the costs of staying on notice. Normally, even if one could not identify patent risks from searching for relevant claim language, one might search the patent holdings of known competitors to steer clear of potential infringement. However, PAEs are by definition non-competing entities and often assign their patents to shell companies and subsidiaries making an essential component of notice – *who owns what* – difficult to ascertain. For example the PAE Intellectual Ventures distributes its 25,000-50,000-deep patent portfolio among as many as 1,100 shell companies. Avancept, *A Study of: The Intellectual Ventures Portfolio in the United States: Patents & Applications* 6 (2d ed. 2010); *see also* Tom Ewing &

Robin Feldman, *The Giants Among Us*, 2012 Stan. Tech. L. Rev. 1, ¶¶ 21, 23, http://stanford.io/1jMBvPn. Similar behavior is widely reported across the PAE industry. *See generally* Colleen V. Chien, *The Who Owns What Problem in Patent Law* 3 (Santa Clara Univ. Legal Studies Research Paper No. 03-12, 2012). Obscured ownership allows PAEs to maintain an element of surprise, revealing the patent only after substantial investments have been made in the commercialization of an infringing technology. *Id.* While abstract patent claims are not the sole source of these strategic behaviors, they match obscure ownership with ambiguous claims yielding more effective ammunition for a patent ambush.

The strategic filing of continuation claims on pending abstract patents also undermines the patent system's notice function. Through continuation filings, patents can unfold gradually into an extended "family" of interrelated claims because patent applicants perpetually retain the right to abandon an application and restart the process, as well as the right to seek additional broader claims arising from the same application. Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. Rev. 63, 64 (2004). This allows patents to linger in the PTO, lying in wait for new companies and technologies to emerge as potential defendants. For example, patents accompanied by continuation filings average 4.16 years before issuance as compared with solitary applications, which average 1.96 years. *Id.* at 71. This behavior is quite prevalent: 23%

of all patent applications contain continuances and 52% of all litigated patents had applications with continuances. *Id.* at 70. While the overall problem of continuations is beyond the scope of the question presented in this case, it is relevant to consider, given that the most litigated patents tend to be software patents owned by PAEs, *see* John R. Allison, Mark A. Lemley & Joshua Walker, *Extreme Value or Trolls on Top? The Characteristics of the Most-Litigated Patents*, 158 U. Pa. L. Rev. 1, 29-31 (2009), and that these highly litigated patents take greatest advantage of continuations, *see* Michael Risch, *Patent Troll Myths*, 42 Seton Hall L. Rev. 457, 479 (2012) (finding an average of four continuations per patent in a sample of the most litigated patents). Thus, a robust § 101 gatekeeper would provide a considerable check on such practices and the notice problems they create with respect to abstract software continuation claims.

C. Abstract Software Patents Contribute to Troublesome Patent Thickets.

When qualitative patent problems – boundary and notice – couple with the quantitative flood of abstract software patents, the result is a patent system so extensively partitioned and overlayed with exclusive rights that it stifles the very progress it is designed to promote. As a complicating factor, software innovation regularly relies on assembling smaller complementary innovations into cumulative products. The Internet browsers challenged by the

Wang patent exhibited data in "frames" as one of many components in a larger and complex way of displaying web pages. When a single product can potentially infringe thousands of patents, the expense of negotiating a license for each claim can become cost-prohibitive. Being an essential part of a whole, any single rights holder may choose to hold-out for the full value of the cumulative invention. *See* Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex. L. Rev. 1991, 1994-98 (2007). Add to this the problem of abstraction, and the task of identifying all relevant rights and negotiating all appropriate licenses for each new version of every software product one sells becomes nearly impossible.

Scholars refer to the problem of overlapping rights as a patent thicket. *See generally* Bronwyn H. Hall et al., *A Study of Patent Thickets*, Report for the UK Intellectual Property Office (Oct. 2012), *available at* http://bit.ly/N6hAQt; Shapiro, *supra*. Patent thickets occur in other complex technologies and a number of public and private policies can ameliorate their effects. However, patents on abstract ideas exacerbate the effects of patent thickets. Even the conscientious inventor determined to push through a software thicket is likely to miss at least some abstract patents, especially if all patentees must do to qualify under § 101 is tether the abstract idea to a general-purpose computer or some other ubiquitous physical device. *See* Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. Rev. 1421, 1424 (2009) (finding that less than 3% of patent litigation in the computer and software industries allege copying – i.e. 97% of cases involve allegations of innocent infringement). Unavoidable inadvertent infringement burdens innovators with unnecessary transaction costs, subverting the rule of law and the intent of the patent system. As Thomas Hobbes urged, "the use of laws is . . . as hedges are set, not to stop travellers, but to keep them in the way. . . . Unnecessary laws are not good laws, but traps for money." Thomas Hobbes, *Leviathan* 252 (A. R. Waller ed. 1904).[4]

III. Sections 102, 103, and 112 Are Not Replacements for the Role of § 101.

Some commentators, including the Federal Circuit, have made a case for allowing "substantive conditions of patentability" – § 102 (novelty), § 103 (nonobviousness), and § 112 (written description, enablement, and best mode) – to resolve the issue of systematically overbroad abstract software patents. *See, e.g.*, *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1260 (Fed. Cir. 2012). However, properly construed, § 101 serves a unique and distinct role from §§ 102, 103, and 112 and, in many cases, a more appropriate one for addressing the incentive, boundary, notice, and thicket problems discussed above.

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[4] It is worth noting that more than efficiency is at stake when an overabundance of law fails to generate notice. Erratic enforcement and recondite doctrine prevent ordinary citizens from reliably planning their lives over the long term. The rule of law demands that citizens be treated as autonomous agents, capable of understanding rules and modifying their behavior voluntarily. Expediently coercing human behavior without first allowing for self-correction violates underlying principles of human dignity. Rational agents, citizens, are treated as cattle to be herded or horses to be broken. *See generally* Jeremy Waldron, *How Law Protects Dignity*, 71 Cambridge L.J. 200 (2012). A patent law that allows abstract claims destroys notice of essential legal commands; it treats society's brightest as valuable victims for the traps set by overzealous patentees and sophisticated, unscrupulous lawyers.

A. Sections 102, 103, and 112 Are Uniquely Ill-Suited to Correct Notice Problems in Software Patents.

In the context of software patents, §§ 102, 103, and 112 suffer from severe systemic challenges, including being ill-suited to reduce notice uncertainty and resulting in excessive litigation costs. *See* Brian J. Love, *Why Patentable Subject Matter Matters for Software*, 81 Geo. Wash. L. Rev. Arguendo 1, 6-10 (2012). For instance, in order to properly evaluate a claim under §§ 102 and 103, it must already have sufficiently clear metes and bounds by which to compare the scope of the claim against the prior art. Thus to function properly, §§ 102 and 103 rely on a robust § 101 to filter out abstract claims as a threshold matter.

Even when the scope of the claims is manageable the PTO has historically found it challenging to search for prior art within the software arts under

§§ 102 and 103. *See* Mark A. Lemley & Bhaven Sampat, *Examiner Characteristics and Patent Office Outcomes*, 94 Rev. Econ. & Stat. 817, 817-18 (2012). For one thing, PTO searches for prior art are generally limited to U.S. and foreign registered patent databases and commercial databases. Sean Tu, *Luck/Unluck of the Draw: An Empirical Study of Examiner Allowance Rates*, 2012 Stan. Tech. L. Rev. 10, ¶ 14, http://stanford.io/1h1YRjw. There is good reason to believe that much software prior art is not formally published anywhere, let alone in a patent application, meaning software prior art may never reveal itself in a search. *See* Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 Berkeley Tech. L.J. 577, 589 (1999); *see also* Iain M. Cockburn & Megan J. MacGarvie, *Patents, Thickets and the Financing of Early-Stage Firms: Evidence from the Software Industry*, 18 J. Econ. & Mgmt. Strategy 729, 731-32 (2009). Lack of publication is also due to the amount of software innovation done outside of established research communities by parties who do not ordinarily make use of the patent system. *See* Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 Calif. L. Rev. 1, 42 (2001). Innovations in unconventional fields are not necessarily described in published journals, but rather, exist in actual business methods or the source code of products that are available to consumers. *See id.* at 13; *see also* Bessen & Meurer, *Patent Failure*, *supra*, at 212-13 ("The general purpose nature of software technology – again, because the technology is abstract, similar techniques can be used in a wide range of applications – means that techniques known in one realm might be applied in another, yet the documentary evidence that the Federal Circuit requires for a demonstration of obviousness might not be published.").

Even when software prior art *has* been published, it is difficult to search for and locate. The PTO itself lacks the resources or expertise to keep up with new prior art. *See* Note, *Estopping the Madness at the PTO: Improving Patent Administration Through Prosecution History Estoppel*, 116 Harv. L. Rev. 2164, 2171 (2003). Where software has been patented, the PTO's classification system has not historically been well-equipped to handle it. Cohen & Lemley, *supra*, at 13. Software innovations are difficult to describe and there is no standardized language for describing them that is known to all interested parties. As a result, performing a search for the words "software" or "computer" could turn up thousands of existing patents but still be missing thousands more that are relevant. Evidence, thus, shows that the PTO routinely issues software patents that overlook prior art. Merges, *supra*, at 589.

Section 112 also suffers from inadequacies as applied to software because the disclosure requirements for software inventions have proven exceptionally lax and permit extremely broad claiming. This makes it almost impossible to invalidate a software patent claim on disclosure grounds, as general functional descriptions are considered adequate. Bessen & Meurer, *Patent Failure*, *supra*, at 210. Software "inventors" can, therefore, obtain claims so broad that they effectively patent the problem, rather than the solution. *See* Lemley, *supra*, at 928-36 (discussing how software patents manage to skirt the limits imposed on functional claiming).

B. Sections 102, 103, and 112 Generate Greater Litigation Costs than § 101.

The substantive conditions of patentability in §§ 102, 103, and 112 also have much greater litigation costs than § 101. While §§ 102 and 103 *require* the court to undertake claim construction as a predicate to conducting an invalidity analysis, § 101 generally does not require time-intensive claim construction to determine abstractness. *See, e.g.*, *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1339 (Fed. Cir. 2013) ("[C]laim construction may not always be necessary for a § 101 analysis."); *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Can. (U.S.)*, 687 F.3d 1266, 1273 (Fed. Cir. 2012) ("[W]e perceive no flaw in the notion that claim construction is not an inviolable prerequisite to a validity determination under § 101."). In fact, this Court has never required claim construction as a predicate for any of its § 101 opinions. *See, e.g.*, *Bilski v. Kappos*, 130 S. Ct. 3218, 3222 (2010) (holding the patent to be ineligible on subject-matter grounds without claim construction). Moreover, an analysis under § 101 is less likely to involve factual determinations, which would result in less discovery and a shorter timeframe for summary judgment.

District courts would also be well served by a strong, clear § 101. District courts have wide latitude in the order in which they decide issues, and providing clear guidance on deciding cases under § 101 would allow lower courts to address this issue and decide cases more quickly. *See CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1284 (Fed. Cir. 2013) ("District courts are rightly entrusted with great discretion to control their dockets and the conduct of proceedings before them, including the order of issues presented during litigation."). As it stands, the perception that § 101 lacks clarity hinders the broad use of this mechanism in litigation. *See MySpace*, 672 F.3d at 1260 (holding that courts may require litigants to address a patent's validity under §§ 102, 103, and 112 before reaching § 101, because doing so would avoid "the murky morass that is § 101 jurisprudence"); Love, *Why Patentable Subject Matter Matters for Software*, *supra*, at 4.

◆

CONCLUSION

Section 101 serves an essential role in our patent system. It works to ensure the proper administration of property rights by balancing incentives for innovation and providing adequate notice while maintaining public access to the ideas necessary for competition. This Court has long been familiar with the corrosive effects of poorly designed intellectual property systems that "embaras[s] the honest pursuit of business with fears and apprehensions of concealed liens and unknown liabilities to lawsuits and vexatious accountings for profits made in good faith." *Atl. Works v. Brady*, 107 U.S. 192, 200 (1883). This case presents an opportunity to reaffirm the innovator's faith in a patent system that grants appropriate reward without abstract encumbrance. Accordingly, this Court should affirm the invalidity of the patent claims at issue here and further hold that abstract ideas in the form of software are unpatentable and that mere computer implementation of those ideas does not create patentability.

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AMICUS
CURIAE
BRIEF

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AND
BRIEFS

Supreme Court, U.S.
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No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.

CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,
Respondents.

**On Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit**

BRIEF OF *AMICUS CURIAE* MARGO LIVESAY, PH.D., IN SUPPORT OF NEITHER PARTY, AND SUGGESTING REVERSAL

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QUESTION PRESENTED

Whether claims to computer-implemented inventions - including claims to systems and machines, processes, and items of manufacture - are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

PARTIES TO THE PROCEEDING

All parties to the proceeding are identified in the caption.

RULE 29.6 STATEMENT

Margo Livesay, Ph.D., *Amicus Curiae*, is an attorney licensed by the State of Texas in 1985, and the District of Columbia in 2003. Both licenses are active. Dr. Livesay is also a registered United States patent attorney. Dr. Livesay spent many years as full-time university Computer Science faculty, after receiving the first Engineering-School Ph.D. in Computer Science from the University of Texas at Arlington (officially awarded in 1982), and prior to becoming a full-time patent attorney. Since leaving academia in 1997, Dr. Livesay has represented numerous clients in software/hardware-related patent work. Dr. Livesay is not filing this brief on behalf of any client, past, present, or future, and respectfully submits that all arguments and opinions (other than cited opinions) expressed herein are her own, in her own individual capacity as a patent attorney, and as an individual person skilled in the art who, on December 8, 1981 (upon completion of her Ph.D. dissertation), experienced trauma in realizing that various forms of intellectual property protection, other than patent, were insufficient to fully protect her Ph.D. dissertation research work.

Dr. Livesay's law firm, Livesay IP Law, PLLC, has no parent corporations and there is no publicly held company that owns 10% or more of any stock in Livesay IP Law, PLLC.

RULE 37.3 STATEMENT

Letters stating blanket consent to the filing of *amicus curiae* briefs, stating that the party consents to the filing of *amicus curiae* briefs in support of either or neither party, are noted in the United States Supreme Court docket for this matter, indicating a docket entry date of December 11, 2013, for blanket consent letters from both parties.

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BACKGROUND OF *AMICUS CURIAE*, MARGO LIVESAY[1]

In December 1981, Dr. Livesay completed and defended her Ph.D. dissertation, Margo List, *The DP Tree—A Data Structure for Multikey Retrieval*, Ph.D. Dissertation, University of Texas at Arlington (1982). The underlying research product included a data structure for clustering and storing data in a novel arrangement on one or more devices, to enable users to search and retrieve the data more efficiently and effectively than with prior arrangements that were known at the time. Dr. Livesay perceived that numerous real-world entities having multiple attribute values (e.g., a person having age, location, income range, family size values, or a catalog item with a color, size, category, etc.) could be modeled as points in k-space (k being the number of such attributes). Using various distance (or similarity) metrics, it can be advantageous to store "close" (or "similar") such points as "clusters," for more efficient retrieval. As stated in Dr. Livesay's dissertation, *Id.*, (page 3):

> Many of the clustering techniques used in previous systems relied on calculations of some distance measure or similarity measure between all pairs of points, or records, in the file. If N is the number of records in the file, these calculations require on the order of N^2 operations. If the machine involved can

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[1] In accordance with Rule 37.6, Amicus submits that Amicus Margo Livesay authored this brief in whole, and funded the preparation and submission of the brief entirely on her own. There were no other persons making any monetary contributions to fund the preparation and submission of this brief, including that no party to this proceeding made or is expected to make, any contributions to fund the preparation and submission of this brief.

> process one million operations per second, and if the file contains one million records, then N^2 operations will require at least eleven and one-half days of processing time. If, instead, a clustering method were used that required only N $\log_2$ N operations, the computation time is reduced to twenty seconds. Considering the cost of computer processing time in general, and the cost of having a database inaccessible to the user during file reorganization, it is obvious that efficient clustering algorithms which produce search-efficient clusters are a worthwhile endeavor for research.

Further, the retrieval of these N (i.e., one million) records stored (i.e., arranged on electronic devices) more randomly might require on the order of N operations for a linear search (i.e., on the order of 1 second for retrieval), while the retrieval using the DP Tree structure might require on the order of $\log_2$ N operations (i.e., on the order of 0.00002 seconds). While Dr. Livesay was not the first person to discover techniques with this range of performance, she believed that her work product was an improvement over numerous prior techniques, from systems that were becoming effectively "useless," to improved systems that might be effectively more "useful." As an example, if computation time took so long, that the need or desire for a computation result of computational operations had long passed before the result was obtained, the result was effectively "useless" for the user. For example, if computation time took several days to generate a weather forecast, or to generate a trajectory scheme for war-related weaponry in active combat, then the systems involved would be effectively useless in providing results after the need had long passed. It was also clear to Dr. Livesay that the magnitudes of these types of computational operations were not amenable to being done "in the heads of humans," nor "with pencil and paper," within a time frame that could be "useful." Further, it was clear to Dr. Livesay that such results were also not "abstract" - but were in fact "concrete" and "tangible," especially as one could typically see, hear, or otherwise experience the results. In today's world of "fast" devices, many users lose interest in a device if its response time exceeds a few seconds (e.g., five to fifteen seconds), proclaiming the device (or application configured to run on the device) as "useless" because it takes too long for the user's needs, or produces results that make little or no sense to the user (i.e., the user is unable to "experience" or "use" the results in a meaningful or timely way, from the user perspective).

In December 1981, Dr. Livesay was advised by personnel in the University of Texas at Arlington Graduate School that many Ph.D. students applied for copyright registrations for their completed dissertations - and thus, she also applied for copyright protection on her completed dissertation. However, she soon learned that such copyright protection was apparently not intended to protect the functionality of her research product - which was the essence of the work, and all her efforts. She also worked with her own university students and colleagues, who were also unhappy with the apparent lack of protection for their novel core ideas, and the resulting techniques involved in development of new and improved computing devices. Thus, in frustration, Dr. Livesay started her law school career at the University of Texas at Austin in 1983, in hopes of finding ways to protect the innovative results of Computer Science research efforts, for herself, and for the computer science community in general. In an intellectual property course in 1984, Dr. Livesay was ecstatic to read (for the first time) *Diamond* v. *Diehr,* 450 U.S. 175 (1981)—and was immediately proclaiming to classmates and friends that the case held that software-related inventions could be patentable subject matter, if sufficiently tied to a machine. She was immediately countered by naysayers (e.g., non-computer-science students) who proclaimed that software inventions were not patentable, and that Dr. Livesay was incorrect in her interpretation of the opinion.

In spite of her efforts, the United States Patent and Trademark Office (USPTO hereafter) specifically stated that a computer science degree was not considered a worthy technical background for obtaining a USPTO registration number for becoming a patent agent or patent attorney. Further, law firms did not respond favorably to her applications for a position as a patent attorney. Thus, after graduating and passing the July 1985 Texas Bar Exam, Dr. Livesay returned to her career as full-time university Computer Science faculty, until 1997, when she was finally hired by a law firm to do patent work, and personally attended the 1997 oral arguments, at the Court of Appeals for the Federal Circuit, for *State Street Bank & Trust v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998).

PROPOSED ANSWER TO QUESTION PRESENTED

Amicus Margo Livesay respectfully submits that claims to computer-implemented inventions - including claims to systems and machines, processes, and items of manufacture - are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court - and thus, the answer to the question posed by the Court should be answered in the affirmative, for all statutory classes of subject matter. Further, as discussed by Judge Rader in *CLS Bank Int'l v. Alice Corp*, 717 F.3d 1269, 1334 (Fed. Cir. 2013):

> And for me, the magisterial statute with its sweeping inclusion of "any" process and even "improvements thereon" without any of the written exceptions for "software per se" or other legislative exceptions featured in failed European and Asian statutes settled the question. Indeed, as the law expressed and the Supreme Court recognized, an invention could extend to "anything under the sun that is made by man." (citing *Diamond v. Diehr*, 450 U.S. 175, 182 (1981))

STATUTORY PROVISION INVOLVED

Section 101 of the Patent Act provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101.

ARGUMENT

I. Intellectual Property Protection for Computer-Related Inventions

Amicus respectfully submits that intellectual property protection for computer-related inventions is typically discussed in terms of trade secrets, trademarks, copyrights, and/or patents. Of course, with trade secret protection, the public will not learn of the invention that must be kept secret, thus depriving the world of the benefit of learning how to make and use it (and further develop the innovative aspects in further research). Trademark protection generally is not intended to cover functionality, nor is copyright, as discussed further below.

II. Copyright (95 years) Does Not Protect the Functional or Efficiency-Driven Parts of Computer Programs (Machines or Processes), Which When Properly Understood Are the Domain of Patent (20 years)

In the copyright matter *Oracle America, Inc. v. Google Inc.*, 872 F.Supp.2d 974, 984, 998 (N.D.Cal. 2012), the District Court addressed the differences between copyright protection and patent protection, stating:

> Turning now to the more difficult question, this trial showcases a distinction between copyright protection and patent protection . . . A question then arises whether the copyright holder is more appropriately asserting an exclusive right to a functional system, process, or method of operation that belongs in the realm of patents, not copyrights.
>
> . . .
>
> Much of Oracle's evidence at trial went to show that the design of methods in an API was a creative endeavor. Of course, that is true. Inventing a new method to deliver a new output can be creative, even inventive, including the choices of inputs needed and outputs returned. The same is true for classes. But such inventions - at the concept and functionality level - are protectable only under the Patent Act. The Patent and

Trademark Office examines such inventions for validity and if the patent is allowed, it lasts for twenty years.

III. Patent Protection Must Extend to Computer-Implemented Inventions

Amicus respectfully submits that claims to computer-implemented inventions - including claims to systems and machines, processes, and items of manufacture - are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court, as copyright protection is insufficient to protect such inventions. Further, the Constitution of the United States, Article I, Section 8, clause 8, states:

> The Congress shall have Power . . .
>
> To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries

Thus, as copyright does not protect computer-related "discoveries" at the "concept and functionality level," - such "discoveries," if not kept secret and unavailable to the public, are protectable only under the Patent Act.

As further evidence of the applicability of patent law to such "discoveries," Amicus (rather embarrasingly, in 2014) admits that her early career of system design and development substantially consisted of recognizing a problem to be solved, envisioning a solution in her head, and sitting down at a keypunch machine to punch out large numbers of punch cards to be used to run a program embodying a form of a solution, which pretty much executed successfully, on the first run, every time. Amicus can easily analogize this type of development to a situation where a mechanic simply purchases auto parts (and/ or raw materials such metals, rubber, plastics, and fabric), and builds an automobile in the parking lot of an auto parts store with design plans in his/her head.

Over time, however, software-related system design and development evolved into something that is more akin to an engineer designing and developing things, including airplanes, cars, tools, various machines, etc. Over time, as systems became more complex, system development became a process of designing various functional blocks, at varying levels of complexity, with each block's functionality described in block diagrams (and describing interactions among the blocks that is needed to achieve the overall functionality) - and the terms "system engineers" and "software engineers" became common parlance.[2]

For example, such blocks are easily analogized to arrangements of gears, or cogwheels, that are designed and finely fitted to interact with each other, to engage and/ or disengage, at appropriate times, to achieved desired results (e.g., to propel a vehicle, aid in manufacturing products, etc.)—easily understood as, at least, part of mechanical engineering and/ or physics innovations, which have long been favorably recognized under patent eligible considerations.

With such diagrams, programmers skilled in the art could write code to accomplish the functionality of each block, or find already-written code for such blocks (or sub-components thereof) that is designed to interface/interact with other functional blocks in particular ways, and save time and resources by using the already-written routines to interface with the other functional blocks. Such development is directly analogous to "building blocks" or "parts" used in other engineering disciplines (e.g., airplane design, automobile design, machine design, etc.). In fact, Amicus respectfully submits that, similar to auto parts stores, software designers today offer various software components for use in building (or repairing, or improving) new and improved systems. As another example, "toolkits" are routinely sought after by software developers so that they can design and build new and innovative systems to be run on electronic devices.

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[2] Indeed, Amicus received her Ph.D. degree - specializing in computer science - from an engineering school, in 1982.

For example, such complex system development is easily analogized to assembly-line technology, in which complex structures (e.g., cars, airplanes, machines, etc.) are built/ assembled. Further, purchasers of cars may either prefer to purchase a new car model to be "the first" to own one, or may prefer to defer the new car purchase until a later version, to let the designers "work out bugs in the new design" with early purchasers, just as software/ hardware customers may prefer to purchase new software systems (e.g., new operating systems) as soon as they are announced, or may defer the purchase to wait for more "debugged" later versions.

With the commonplace use of such terms, and the widespread availability of such software items (e.g., online, as well as in "walk-in" commercial outlets such as office supply stores, discount outlets that offer many types of items other than software, including outlets that offer groceries as well), Amicus is puzzled that some courts seem to have so much difficulty understanding that software-related inventions (e.g., computer-implemented inventions) should be treated as patentable subject matter in the same way as other subject matter, for example, as in other engineering disciplines.

IV. Petitioner's Brief

Petitioner's brief on the merits for this matter submits that computer-implemented inventions rarely fit within the narrow scope of the "abstract ideas" exception as defined by this Court. Amicus agrees that the "abstract ideas" exception should be applied in very rare circumstances, and only when it is extremely clear that the claim(s) under review are directed to subject matter that is no more than such an "abstract idea." Petitioner's brief on the merits further states (page 15-16):

> The deep and multiple splits in the Federal Circuit's en banc ruling illustrate the confusion in the lower courts regarding the patent eligibility of computer-implemented inventions. As shown by the divergent opinions in this case, that confusion largely stems from uncertainty over how to determine whether a claim to a computer-implemented invention runs afoul of the judicial exception for "abstract ideas."

As understood by Amicus, Petitioner's brief on the merits then offers guidance in potentially resolving some of the confusion with regard to determinations of whether claims are directed to the judicial exception for "abstract ideas."

V. Reviewers of Patentable Subject Matter Have Been Experiencing Frustration and Confusion in Attempts to Distinguish Claims that are Directed to "Abstract Ideas," from Claims that are not Directed to "Abstract Ideas," with Massive Disagreement in their Review

For example, in *Accenture Global Services, GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1346, 1347 (Fed. Cir. 2013), Judge Rader (in dissent) expressed frustration with the task of analyzing claims as "abstract ideas," stating:

> "[A]ny claim can be stripped down, simplified, generalized, or paraphrased to remove all of its concrete limitations, until at its core, something that could be characterized as an abstract idea is revealed. A court cannot go hunting for abstractions by ignoring the concrete, palpable, tangible limitations of the invention the patentee actually claims." *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1344 (Fed.Cir.2013).
>
> . . .
>
> In conclusion, I note that prior to granting en banc review in *CLS Bank*, this court commented: "no one understands what makes an idea abstract." *CLS Bank Int'l v. Alice Corp.*, 685 F.3d 1341, 1349 (Fed.Cir.2012), *opinion vacated*, 484 Fed.Appx. 559 (Fed.Cir.2012) (internal quotations marks omitted). After *CLS Bank*, nothing has changed. "Our opinions spend page after page revisiting our cases and those of the Supreme Court, and still we continue to disagree vigorously over

> what is or is not patentable subject matter." *MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1259 (Fed.Cir.2012); *see generally CLS Bank*. Indeed, deciding what makes an idea "abstract" is "reminiscent of the oenologists trying to describe a new wine." *MySpace*, 672 F.3d at 1259.
>
> I take this opportunity to reiterate my view that "the remedy is the same: consult the statute!" *CLS Bank*, 717 F.3d at 1335 (additional reflections of Rader, C.J.). The statute offers broad categories of patent-eligible subject matter. The "ineligible" subject matter in these system claims is a further testament to the perversity of a standard without rules—the result of abandoning the statute. I respectfully dissent.

VI. Determinations of Whether Claims are Directed to "Abstract Ideas" Should Not Focus on "Prior Art" Considerations, as Those are Specifically Reserved for Anticipation and Obviousness Review

Amicus does not attempt to duplicate the well-reasoned explanations in Petitioner's brief, but instead offers additional suggestions herein for potentially easing some of the burden (and confusion) of such determinations. For example, Amicus respectfully submits further that, if consideration of whether the subject matter is an "abstract idea" hinges on whether the subject matter is "old" or otherwise "well-known," that the § 101 review should not be mixed with considerations that are reserved for § 102 (anticipation), § 103 (obviousness), and/or § 112 (specification) review, which should be conducted as separate considerations. Amicus respectfully requests that the Court recommend that any such "abstract idea" reviews should only be entertained after the reviewer has received input from parties regarding potential § 102, § 103, and/or § 112 issues, using the correct standards for each respective type of issue, resolving such questions prior to moving to a finding that the subject matter is an "abstract idea" under § 101. Amicus further requests that the Court reconsider, or further clarify, certain portions of its opinion in *Bilski v. Kappos*, 130 S. Ct. 3218 (2010), in an effort to provide more guidance and certainty in future determinations of subject matter eligibility under § 101.

Amicus additionally submits that such a recommendation might aid in resolving potential disputes regarding whether subject matter should be determined as an "abstract idea" due to its nature as a "natural phenomenon" or other type of "law of nature." Clearly, if the claim as a whole is directed to no more than a mathematical equation, then it would seem to be suspect as an "abstract idea." For example, consider a "summation" claim such as:

> A method comprising:
>
> obtain a first integer value;
>
> obtain a second integer value;
>
> determine the sum of the first integer value
> and the second integer value.

Amicus respectfully submits that there would likely be ample prior art (or skilled experts, perhaps elementary school teachers or students) available to determine that the "summation" claim above would be invalid under (at least) § 102 (anticipation), as a threshold question, without resorting to § 101 analysis (*e.g.*, as a mathematical equation, law of nature, or "abstract idea"), although this particular example lies within the realm of potentially easily settled disputes over patentability. In *Alexsam, Inc. v. IDT Corp.*, 715 F.3d 1336 (Fed. Cir. 2013), decided after the current matter on appeal herein, the United States Court of Appeals for the Federal Circuit held that the claims on appeal were not invalid, based on § 103 (obviousness) analysis (with no mention of any § 101 issues), and a Judge Mayer dissent, *Id.* at 1349, states:

> Whether claims are directed to statutory subject matter is a "threshold" question, *Bilski v. Kappos*, —— U.S. ——, 130 S.Ct. 3218, 3225, 177 L.Ed.2d 792 (2010), which must be addressed before this court can consider subordinate issues related to obviousness and infringement. See *Parker v. Flook*, 437 U.S. 584, 593, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) ("*Flook*") (emphasizing that "[t]he obligation to determine what type of discovery is sought to be patented" so as to determine whether it falls within the ambit of section 101 "*must precede* the determination of whether that discovery is, in fact, new or obvious" (emphasis added))

However, Amicus respectfully submits that § 101, in part, states *(emphasis added)*, "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter . . . may obtain a patent therefor, *subject to the conditions and requirements of this title.*" A simple reading of the statutory language, coupled with the "*Flook*" language cited by Judge Mayer *Id.*, indicates that "determining what type of discovery is sought to be patented," coupled with "*must precede* the determination of whether that discovery is, in fact, new or obvious" only reinforces the concept that § 101 analyses should not be predicated on whether claimed subject matter is "in fact, new or obvious," as they are separate determinations, for separate issues. As stated in *Diamond v. Diehr*, 450 U.S. 175, 189-190 (1981):

> It has been urged that novelty is an appropriate consideration under § 101. Presumably, this argument results from the language in § 101 referring to any "new and useful" process, machine, etc. Section 101, however, is a general statement of the type of subject matter that is eligible for patent protection "subject to the conditions and requirements of this title." Specific conditions for patentability follow and § 102 covers in detail the conditions relating to novelty. The question therefore of whether a particular invention is novel is "wholly apart from whether the invention falls into a category of statutory subject matter."

Amicus respectfully notes that *Diamond* v. *Diehr*, 450 U.S. 175 at 193 (1981) additionally states (*emphasis added*):

> Similarly, a mathematical formula does not become patentable subject matter merely by including in the claim for the formula token postsolution activity such as the type claimed in *Flook*. *We were careful to note in Flook that the patent application did not purport to explain how the variables used in the formula were to be selected, nor did the application contain any disclosure relating to chemical processes at work or the means of setting off an alarm or adjusting the alarm unit. Ibid.* All the application provided was a "formula for computing an updated alarm limit." *Ibid.*

Amicus respectfully suggests that the text above seems to offer a hint that such considerations may have been more appropriately separately analyzed under a § 112 (specification) review, instead of § 101 review.

VII. Clearer Guidance from the Court is Needed for Determinations of Whether Claims are Directed to "Abstract Ideas"

In reviewing various court opinions, since *Bilski v. Kappos*, 130 S. Ct. 3218 (2010), regarding findings with regard to whether claims are directed to an "abstract idea," Amicus is rather unfortunately reminded of *Jacobellis v. State of Ohio*, 378 U.S. 184, 197 (1964), a matter dealing with questions of pornography, in which Justice Stewart, in concurrence, discussed how it was possible to read other opinions of the Court (*emphasis added*):

> "in a variety of ways. In saying this, I imply no criticism of the Court, which in those cases was *faced with the task of trying to define what may be indefinable*. . . I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligibly doing so. *But I know it when I see it*, and the motion picture involved in this case is not that."

Amicus further respectfully submits that Examiners at the U.S. Patent and Trademark Office (USPTO) are provided with Guidelines for Examination of such claims, and is attaching a "101 Method Eligibility Quick Reference Sheet" downloaded from the USPTO during preparation of this amicus brief. As shown in the "101 Method Eligibility Quick Reference Sheet," Examiners are provided guidance in determining whether a method claim is directed to an abstract idea. As shown in the attached Appendix, on page 5a, Examiners are provided with:

> 4) Sample Form Paragraphs:
>
> a. Based upon consideration of all of the relevant factors with respect to the claim as a whole, claim(s) [1] held to claim an abstract idea, and is therefore rejected as ineligible subject matter under 35 U.S.C. § 101. The rationale for this finding is explained below: [2]
>
> 1. In bracket 2, identify the decisive factors weighing against patent-eligibility, and explain the manner in which these factors support a conclusion of ineligibility. The explanation needs to be sufficient to establish a prima facie case of ineligibility under 35 U.S.C. § 101.

Amicus respectfully submits that these guidelines do not suggest that Examiners inform patent applicants as to what specific "abstract idea" is alleged, leaving the probability of claim rejections based solely on an individual Examiner's decision (i.e., a test of "I know it when I see it") that a method claim is somehow directed to some kind of an "abstract idea," leaving applicants with the burden of either making shoot-in-the-dark response arguments that the claim is not an "abstract idea," or responding with a request for particularity with regard to the precise "abstract idea" that is alleged - leading to a tremendous waste of applicant and Examiner time and resources. Amicus respectfully submits that such guidance may result in almost as many different opinions on identification of "abstract ideas" in claims, as there are Examiners at the USPTO.

Further, these guidelines are easily subject to interpretations requiring that method claims be tied to some type of machine or apparatus, or fail the test for eligibility under § 101. However, 35 U.S.C. § 100 (b) states:

> b) The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

A plain reading of the statutory definition of "process" clearly indicates that a "method" is a "process" under 35 U.S.C. § 100 (b), with no requirement that such a "method" be tied to a machine. As stated in *Diamond v. Diehr*, 450 U.S. 175, 182-184 (1981):

> It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted, and not for the result or effect itself. It is when the term process is used to represent the means or method of producing a result that it is patentable, and will include all methods or means which are not effected by mechanism or mechanical combinations."
>
> "That a process may be patentable, irrespective of the particular form of the instrumentalities used, cannot be disputed. . . . A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful,

> it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result. The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence." *Cochrane v. Deener*, 94 U.S. 780, 787-788, 24 L.Ed. 139 (1877)."

VIII. Prior "Clue-Providing" Tests Need to be Re-considered to Aid in Resolutions of Determinations of Whether Claims are Directed to Abstract Ideas, At a Minimum

As an example, Amicus respectfully requests that the Court re-consider and re-evaluate its past positions with regard to *State Street Bank & Trust v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998) and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999) - and *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994). For example, in ***Bilski v. Kappos***, 130 S. Ct. 3218, 3231 (2010), the Court stated:

> And nothing in today's opinion should be read as endorsing interpretations of § 101 that the Court of Appeals for the Federal Circuit has used in the past. See, e.g., *State Street*, 149 F.3d, at 1373; *AT & T Corp.*, 172 F.3d, at 1357. . . . In disapproving an exclusive machine-or-transformation test, we by no means foreclose the Federal Circuit's development of other limiting criteria that

> further the purposes of the Patent Act and are not inconsistent with its text.

In *Bilski v. Kappos*, 130 S. Ct. 3218, 3232 (2010), the Court stated (in a concurrence footnote 1):

> "Even if the machine-or-transformation test may not define the scope of a patentable process, it would be a grave mistake to assume that anything with a "'useful, concrete and tangible result,'" *State Street Bank & Trust v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (C.A.Fed.1998), may be patented."

Amicus respectfully submits that a literal reading of the text "it would be a grave mistake to assume that anything with a " 'useful, concrete and tangible result,' . . . may be patented" strongly implies that *nothing* "with a 'useful, concrete and tangible result,'" may be patented.

Further, *Id.* at 3259, stated:

> The machine-or-transformation test is thus an important example of how a court can determine patentability under § 101, but the Federal Circuit erred in this case by treating it as the exclusive test. Fourth, although the machine-or-transformation test is not the only test for patentability, this by no means indicates that anything which produces a "'useful, concrete, and tangible result,'" *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (C.A.Fed.1998), is patentable.

Additionally, Amicus respectfully submits that a literal reading of the text "this by no means indicates that anything which produces a " 'useful, concrete, and tangible result,' . . . , is patentable" similarly implies that *nothing* "with a 'useful, concrete and tangible result,'" is patentable. Amicus respectfully submits that such literal interpretations would render many of today's highly respected inventions unpatentable, as producing "useful, concrete, and tangible results." Amicus urges the Court's re-consideration that a determination that a claim is directed to subject matter that somehow involves a "useful, concrete, and tangible result," *must* (at least) be included in the "important clues" to be considered in patent eligibility considerations under § 101 (or, preferably, the original test may be restored, with approval, in its original form). Amicus further submits that the original test in *State Street Bank, id.*, seemed to work well (and eliminated substantial confusion), until the pronouncements in *Bilski v. Kappos*, 130 S. Ct. 3218, 3232 (2010), which were widely interpreted as meaning that the "useful, concrete, and tangible result" test was no longer valid, which Amicus believes has contributed to much of the uncertainty leading up to the present matter's apparent confusion and controversy.

Amicus respectfully requests that the Court reconsider its stance with regard to the "useful, concrete, and tangible result" test that was developed by the Court of Appeals for the Federal Circuit, to aid in determinations of patentability under § 101 - most especially if a reviewer is grappling with the question of whether a claim is directed to an "abstract idea." Judge Rich has been credited with playing a significant role in development of the test, and Amicus respectfully submits that Judge Rich had a rich history (pun not intended) in the development of U.S. patent law, including co-authoring the 1952 Patent

Act (i.e., begging the question, "Who better to understand the law, and how to interpret it, than the person who actually wrote it?"). While Judge Rich is no longer alive to provide his guidance on the questions in play in the present matter, he already left a significant legacy of helpful "clues," which included (at the very least) the opinion in *State Street Bank & Trust v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998). Without reproducing it herein, Amicus urges the Court to review Judge Rader's discussion of the drafting of the 1952 Patent Act, in *CLS Bank Int'l v. Alice Corp*, 717 F.3d 1269, 1294-1297 (Fed. Cir. 2013).

Amicus further respectfully submits that Judge Rader underscores the difficulty in determining what is abstract, when this Court has seemingly limited (as discussed above) considerations of whether claims might recite inventions that produce a "useful, concrete, and tangible result." As Judge Rader discusses in *CLS Bank Int'l v. Alice Corp*, 717 F.3d 1269, 1299-1300 (Fed. Cir. 2013):

> An abstract idea is one that has no reference to material objects or specific examples— *i.e.*, it is not concrete. See Merriam–Webster's Collegiate Dictionary 5 (11th ed.2003) (defining abstract as "disassociated from any specific instance . . . expressing a quality apart from an object <the word *poem* is concrete, *poetry* is [abstract]>"). A claim may be premised on an abstract idea—the question for patent eligibility is whether the claim contains limitations that meaningfully tie that idea to a concrete reality or actual application of that idea.

Judge Rader further states, *Id.* at 1302:

> At bottom, where the claim is tied to a computer in such a way that the computer plays a meaningful role in the performance of the claimed invention, and the claim does not pre-empt virtually all uses of an underlying abstract idea, the claim is patent eligible.

Judge Rader further states, *Id.* at 1298, "A court cannot go hunting for abstractions by ignoring the concrete, palpable, tangible limitations of the invention the patentee actually claims."

Amicus respectfully submits that virtually any analysis with a goal of determining whether "something" is not "abstract" very naturally leads to a discussion of whether that "something" is "concrete," and potentially "tangible" as well. In short, and as discussed above, Amicus requests the Court to relax its previous statements with regard to "useful, concrete, and tangible results," so that other courts do not fear running afoul of the Court's precedents if they revert to use of the terms "concrete," and/or "tangible" - or even if, in certain situations, revert to the use of the "useful, concrete, and tangible results" test to resolve confusion over "abstract idea" questions. Amicus thus respectfully requests the Court to re-instate, and approve the "useful, concrete, and tangible result" test, as discussed above.

CONCLUSION

In conclusion, Amicus respectfully requests that the Court find that the "Question Presented" should be answered in the affirmative, for all statutory classes of subject matter, and that the Court will re-consider and approve various tests that may provide important "clues" for subject matter eligibility, at least in accordance with suggestions provided herein. Amicus further respectfully requests caution in making limiting statements regarding "business methods" or "methods of doing business," as such terminology is vague at best, and may easily be interpreted as covering substantially anything that is performed by today's devices. Finally, Amicus respectfully requests, at least, reversal in the present matter.

Respectfully submitted,

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APPENDIX

APPENDIX

101 Method Eligibility Quick Reference Sheet

The factors below should be considered when analyzing the claim **as a whole** to evaluate whether a method claim is directed to an abstract idea. However, not every factor will be relevant to every claim and, as such, need not be considered in every analysis. When it is determined that the claim is patent-eligible, the analysis may be concluded. In those instances where patent-eligibility cannot easily be identified, every relevant factor should be carefully weighed before making a conclusion. Additionally, no factor is conclusive by itself, and the weight accorded each factor will vary based upon the facts of the application. These factors are not intended to be exclusive or exhaustive as there may be more pertinent factors depending on the particular technology of the claim. For assistance in applying these factors, please consult the accompanying "Interim Guidance" memo and TC management.

Factors Weighing Toward Eligibility:

- Recitation of a machine or transformation (either express or inherent).
    - Machine or transformation is particular.
    - Machine or transformation meaningfully limits the execution of the steps.
    - Machine implements the claimed steps.
    - The article being transformed is particular.
    - The article undergoes a change in state or thing (e.g., objectively different function or use).
    - The article being transformed is an object or substance.

- The claim is directed toward applying a law of nature.
  - Law of nature is practically applied.
  - The application of the law of nature meaningfully limits the execution of the steps.
- The claim is more than a mere statement of a concept.
  - The claim describes a particular solution to a problem to be solved.
  - The claim implements a concept in some tangible way.
  - The performance of the steps is observable and verifiable.

Factors Weighing Against Eligibility:

- **No recitation of a machine or transformation (either** express **or inherent).**
- Insufficient recitation of a machine or transformation.
  - Involvement of machine, or transformation, with the steps is merely nominally, insignificantly, or tangentially related to the performance of the steps, e.g., data gathering, or merely recites a field in which the method is intended to be applied.
  - Machine is generically recited such that it covers any machine capable of performing the claimed step(s).
  - Machine is merely an object on which the method operates.

  - Transformation involves only a change in position or location of article.
  - "Article" is merely a general concept (see notes below).
- The claim is not directed to an application of a law of nature.
  - The claim would monopolize a natural force or patent a scientific fact; e.g., by claiming every mode of producing an effect of that law of nature.
  - Law of nature is applied in a merely subjective determination.
  - Law of nature is merely nominally, insignificantly, or tangentially related to the performance of the steps.
- The claim is a mere statement of a general concept (see notes below for examples).
  - Use of the concept, as expressed in the method, would effectively grant a monopoly over the concept.
  - Both known and unknown uses of the concept are covered, and can be performed through any existing or future-devised machinery, or even without any apparatus.
  - The claim only states a problem to be solved.
  - The general concept is disembodied.
  - The mechanism(s) by which the steps are implemented is subjective or imperceptible.

NOTES:

1) Examples of general concepts include, but are not limited, to:

- Basic economic practices or theories (e.g., hedging, insurance, financial transactions, marketing);
- Basic legal theories (e.g., contracts, dispute resolution, rules of law);
- Mathematical concepts (e.g., algorithms, spatial relationships, geometry);
- Mental activity (e.g., forming a judgment, observation, evaluation, or opinion);
- Interpersonal interactions or relationships (e.g., conversing, dating);
- Teaching concepts (e.g., memorization, repetition);
- Human behavior (e.g., exercising, wearing clothing, following rules or instructions);
- Instructing "how business should be conducted."

2) For a detailed explanation of the terms machine, transformation, article, particular, extrasolution activity, and field-of-use, please refer to the Interim Patent Subject Matter Eligibility Examination Instructions of August 24, 2009.

3) When making a subject matter eligibility determination, the relevant factors should be weighed with respect to the claim **as a whole** to evaluate whether the claim is patent-eligible or whether the abstract idea exception renders the claim ineligible. When it is determined that the claim is patent-eligible, the analysis may be concluded. In those instances where patent-eligibility cannot be easily identified, every relevant factor should be carefully weighed before making a conclusion. Not every factor will be relevant to every claim. While no factor is conclusive by itself, the weight accorded each factor will vary based upon the facts of the application. These factors are not intended to be exclusive or exhaustive as there may be more pertinent factors depending on the particular technology of the claim.

4) Sample Form Paragraphs:

a) Based upon consideration of all of the relevant factors with respect to the claim as a whole, claim(s) [1] held to claim an abstract idea, and is therefore rejected as ineligible subject matter under 35 U.S.C. § 101. The rationale for this finding is explained below: [2]

> 1. In bracket 2, identify the decisive factors weighing against patent-eligibility, and explain the manner in which these factors support a conclusion of ineligibility. The explanation needs to be sufficient to establish a *prima facie* case of ineligibility under 35 U.S.C. § 101.

b) Dependent claim(s) [1] when analyzed as a whole are held to be ineligible subject matter and are rejected under 35 U.S.C. § 101 because the additional recited limitation(s) fail(s) to establish that the claim is not directed to an abstract idea, as detailed below: [2]

> 1. In bracket 2, provide an explanation as to why the claim is directed to an abstract idea; for instance, that the additional limitations are no more than a field of use or merely involve insignificant extrasolution activity; e.g., data gathering. The explanation needs to be sufficient to establish a *prima facie* case of ineligibility under 35 U.S.C. § 101.

AMICUS
CURIAE
BRIEF

Supreme Court, U.S.
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No. 13-298

In The
Supreme Court of the United States

ALICE CORPORATION PTY., LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, et al.,

Respondents.

**On Writ Of Certiorari To The
United States Court Of Appeals
For The Federal Circuit**

BRIEF OF PROFESSORS PETER S. MENELL AND JEFFREY A. LEFSTIN AS AMICI CURIAE IN SUPPORT OF RESPONDENTS

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INTEREST OF AMICI CURIAE[1]

The authors of this brief are professors of law at the University of California who study and teach intellectual property law.

Professor Jeffrey Lefstin holds a law degree and a doctorate degree in biochemistry. He worked as a molecular biologist prior to studying law. His scientific papers appeared in Nature, Genes & Development, and the Journal of Molecular Biology. Much of his research has focused on the historical development of patent law and its institutions. He recently completed a detailed historical study of patent eligibility doctrines. See Jeffrey A. Lefstin, Inventive Application: A History (manuscript Feb. 23, 2014), available at <http://ssrn.com/abstract=2398696 >.

Professor Menell holds a law degree and a doctorate degree in economics. Beginning in law school, he has focused a significant portion of his research on legal protection for computer software and intellectual property law more generally. Soon after joining the University of California at Berkeley School of Law faculty in 1990, he laid the groundwork to establish the Berkeley Center for Law & Technology (BCLT). Since its founding in 1995, BCLT has sought to foster the beneficial and ethical understanding of intellectual property (IP) law and related fields as they affect public policy, business, science and technology through a broad range of public policy conferences, collaboration with government agencies (U.S. Patent & Trademark Office, Federal Trade Commission), interaction with intellectual property practitioners and technology companies, and research and educational initiatives. BCLT has provided a valuable ongoing vantage point for viewing the evolution of the high technology field as well as the challenges posed by legal protection for computer software for inventors, start-up companies, entrepreneurs, established technology companies, patent professionals, government officials, jurists, and the public.

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[1] Pursuant to Sup. Ct. R. 37.6, amici note that no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than amici curiae made a monetary contribution to its preparation or submission. Petitioner and Respondents have consented to the filing of this brief through blanket consent letters filed with the Clerk's Office.

One of Professor Menell's early initiatives at BCLT was to reach out to the Federal Judicial Center to offer assistance in preparing judges to handle the growing wave of intellectual property litigation in the "dot-com era." Since 1998, he has organized and taught more than 50 judicial education programs for the Federal Judicial Center, circuit courts, and district courts on intellectual property law, including an annual multi-day program for 30 to 45 federal judges that covers patent law and patent case management. This experience led him to develop and co-author a treatise for federal judges. See Peter S. Menell, Lynn H. Pasahow, James Pooley, & Matthew D. Powers, *Patent Case Management Judicial Guide* (Federal

Judicial Center 1st ed. 2009, 2nd ed. 2012 (adding Steven C. Carlson and Jeffrey G. Homrig)). These experiences exposed him to the substantial challenges that federal judges encounter in patent litigation.

From June 2012 through June 2013, Professor Menell served as one of the U.S. Patent & Trademark Office's inaugural Thomas Alva Edison Visiting Professionals where he had the opportunity to view firsthand the challenges faced by patent officials in applying court rulings on the scope of patentable subject matter.

This brief draws on the authors' wide range of experience with the patent system and science, technology, and economic research to address the critically important scope of patentable subject matter.

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SUMMARY OF ARGUMENT

The Federal Circuit's fractured opinion in this case highlights the difficulty of applying complex, malleable, extra-statutory criteria to the threshold question of patent-eligible subject matter. That difficulty has arisen in part because historical conceptions of subject matter exclusions were rooted not in utilitarian concerns, but in religious and philosophical conceptions of the domain of man as well as limited understanding of scientific principles.

Yet while English and American courts in the foundational periods of patent law voiced subtle religious and philosophical concerns, their definition of the boundaries of the patent system was clear and straightforward. From the mid 19th century through the mid 20th century, this Court and the lower courts consistently held that while natural laws, physical phenomena, and abstract principles could not be the subject of patents, practical applications of such natural principles and discoveries in a technological field sufficed to confer patent eligibility.

It was not until this Court's *Funk Brothers* decision in 1948, shortly before passage of the 1952 Patent Act, that "inventive application" became a test for patent eligibility. While it is necessary that the patent system have subject matter bounds, a test of inventive application neither serves the underlying purposes of the patent system nor comports with the process of modern technological advance. Particularly in light of past experience, setting inventive application as the test for patent eligibility threatens to undermine the invention incentives, hamper patent prosecution, and greatly complicate patent litigation.

The problems posed by patents on software and other computer-implemented inventions are real, but for the threshold question of patent eligibility this Court should turn away from the *Funk Brothers/Flook/Mayo* paradigm and require only that claims (1) fall within the constitutionally prescribed domain of the useful (technological) arts, and (2) apply scientific principles to specific problems. The issues that arise from software patents are frequently far removed from those that arise in the context of other classes of inventions. Rather than attempt a universal framework via amorphous and misguided patent eligibility requirements, this Court should instead focus on elucidating statutory patentability requirements as well as clarifying the constitutional and jurisprudential foundation for legislative and administrative solutions that can more directly address the evolving needs of the patent system.

◆

ARGUMENT

There is no greater confusion in contemporary patent law than that surrounding the scope of patent eligibility limitations. Since its enactment in the nation's first legislative session, Patent Act of 1790, Ch. 7, 1 Stat. 109 (Apr. 10, 1790), the Patent Act has broadly authorized the granting of patents for technological arts (processes), machines, compositions of matter, and articles of manufacture without subject matter limitations, see 35 U.S.C. § 101, save an express provision added recently barring "a claim directed to or encompassing a human organism." Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 33, 125 Stat. 284, 340 (Sept. 16, 2011). Yet for almost as long, the courts have recognized non-textual limitations on patent eligibility.

The court-made patent eligibility doctrines emerged in a bygone era when the judiciary played a more active role in fleshing out terse statutory regimes. See Peter S. Menell, The Mixed Heritage of Federal Intellectual Property Law and Ramifications for Statutory Interpretation, Intellectual Property and the Common Law 63, 63-64, 71 n.47 (Shyam Balganesh ed., 2013). Although their legal source – whether constitutional, statutory, or common law – has remained unclear, they continue to operate notwithstanding some tension with contemporary views of statutory construction. See *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010) (observing that "[w]hile these exceptions are not required by the statutory text, they are consistent with the notion that a patentable process must be 'new and useful.' And, in any case, these exceptions have defined the reach of the statute as a matter of statutory *stare decisis* going back 150 years.").

The salience of these doctrines has ebbed and flowed over the arc of U.S. history. Their applicability and contours have long been difficult to discern, but the deep fracturing of the Federal Circuit in this case, see *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269 (Fed. Cir. 2013) (five opinions and additional reflections of the Chief Judge), indicates that the problem has reached dire levels. This confusion undermines the functioning of the patent system on multiple levels: inventors (and their attorneys/agents) cannot readily determine whether and how to draft patent applications; patent examiners cannot predictably evaluate patent eligibility; competitors cannot easily assess freedom to operate and the risks of patent litigation; district and Federal Circuit judges struggle to interpret eligibility boundaries; and legislators lack clear understanding of the patent landscape as well as their authority to effectuate reform.

The roots of the problem trace to the common law origins of patentable subject matter limitations during the late 18th and early to mid 19th centuries. In that early scientific era, courts excluded abstract macroscopic "scientific principles" – such as steam power, electricity, and electromagnetism – from patentable subject matter based upon a limited understanding of science as well as religious and philosophical beliefs. See Joshua D. Sarnoff, Patent-Eligible Inventions after *Bilski*: History and Theory, 63 Hastings L.J. 53, 84-90 (2011). Early jurists – writing before important advances in microscopy, classification of the periodic table, Charles Darwin's *On the Origin of the Species*, Gregor Mendel's discovery of genetics (and its long-delayed recognition in the scientific community), or the advent of digital computers – distinguished between God's "natural laws" and human discovery and application of those principles.

At a practical level, however, the distinction operated merely to exclude patents on abstract principles. While abstract ideas and discoveries were not patentable, a practical application by the inventor sufficed for patent-eligibility. That was the teaching of *Neilson v. Harford*, Webster's Patent Cases 295 (1841), the historic English case on which this Court has based so many of its landmark decisions. See Jeffrey A. Lefstin, Inventive Application: A History

24-26 (manuscript Feb. 23, 2014), available at <http://ssrn.com/abstract=2398696>. And that was the consistent theory and practice in the United States as well. From the mid 19th century to the mid 20th, patents were limited to the technological arts, but inventors did not encounter eligibility problems where they adequately enabled new machines, processes, compositions, and manufactures. Relying on *Neilson*, this Court made clear in decisions like *Le Roy v. Tatham*, 55 U.S. (14 How.) 156 (1853); *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854); and *Tilghman v. Proctor*, 102 U.S. 707 (1880), that the boundary between unpatentable principle and patent-eligible invention was the requirement of practical application. See Lefstin, *supra*, at 30-34. The requirements of novelty and commensurability between patent scope and disclosure served to confine inventors' rights to their contribution to the art. See *id.* at 34-35. By the 1930s, it was well established that, mental steps and natural products possibly excepted, any practical and tangible application of a fundamental principle might be eligible for a patent. See *id.* at 54-56.

The Court's 1948 decision in *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 effected a significant shift in the patent eligibility standard by injecting an additional requirement: that the inventor show inventiveness in the application of natural principles, whether or not the inventor discovered those principles. Until *Funk Brothers*, American decisions and authorities consistently understood that practical applications of new discoveries might be patented without any additional requirement of inventive application. See Lefstin, *supra*, at 35-41. That had been a teaching of *Neilson v. Harford* as well. Although the Court's decisions in *Parker v. Flook*, 437 U.S. 584, 592 (1978) and *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1300 (2012), suggested that *Neilson* demanded inventive application, the Court of Exchequer sustained Neilson's patent against the defendant's enablement challenge largely *because* Neilson's mode of application was routine and conventional in the field. See Lefstin, *supra*, at 24. Baron Parke's famous statement that Neilson's "principle" should be regarded as "well known" was *not* a holding that his discovery should be treated as part of the prior art, nor that his means of heating need be inventive. It was instead a reference to previous decisions of the Exchequer, where Parke had construed a patent on an adjustable chair to cover other applications of a "well known" principle of mechanics, the lever, by different means. That same doctrine was invoked in *Neilson* to determine that Neilson had claimed a patentable application rather than an abstract principle, and that his patent might extend beyond the exact apparatus he disclosed; the only difference was that Neilson's "principle" was new rather than well-known – an observation that strengthened the case for patentability. See *id.* at 21-23.

This Court's decision in *Flook*, based on a misapprehension of *Neilson*, hearkened back to *Funk Brothers* for the notion that only an "inventive" application is an invention or discovery within the meaning of the patent statutes. The Court's decision in *Diamond v. Diehr*, 450 U.S. 175 (1981) turned away from that approach, perhaps recognizing that the 1952 Patent Act represented more of a rejection of "inventiveness" and "inventive genius" than an endorsement. Yet the *Mayo* decision has revived the *Flook* approach, although without displacing *Diehr* or explaining how the two apparently contradictory decisions can be reconciled. Further complicating the matter, this Court's decision in *Association for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013) ("*Myriad*") held that cDNA claims are patent-eligible without applying *Flook*'s inventive application test – despite this Court's statement in *Benson* that product and process claims are subject to the same analysis for patent eligibility. See *Gottschalk v. Benson*, 409 U.S. 63, 67-68 (1972). After three decades of repose, patent eligibility has re-emerged as the most confusing doctrine within all of patent law, leaving inventors, Patent Office officials, lower courts, and the public with little understanding of how to evaluate the limitations on patentable subject matter.

Advocates of patent reform have latched upon this area as a means for addressing all manner of patent system pathologies. While we share many of those concerns, see, e.g., Peter S. Menell & Michael J. Meurer, Notice Failure and Notice Externalities, 5 J. Leg. Anal. 1 (2013); Peter S. Menell, A Method for Reforming the Patent System, 13 Mich. Telecom. & Tech. L. Rev. 487 (2007); see generally Peter S. Menell & Suzanne Scotchmer, Intellectual Property Law, in

2 Handbook of Law and Economics 1476 (A.M. Polinsky & S. Shavell eds. 2007). Peter S. Menell, Tailoring Legal Protection for Computer Software, 39 Stan. L. Rev. 1329 (1986), we believe that reviving the inventive application doctrine is historically misguided, doctrinally unwise, and likely to exacerbate problems plaguing the patent system. It detracts attention from encouraging substantial scientific and technological advances, destabilizes countless patents that have issued in the decades since the *Diehr* decision, and opens up a veritable Pandora's box of case management issues.

As a result of advances in scientific understanding and methods over the past 150 years, many if not most inventions today explicate, manipulate, and control physical, chemical, biological, and digital phenomena at elemental, molecular, algorithmic, and systemic levels. Doctrines that treat conventional application of even newly discovered computer algorithms, molecular pathways, and chemical synthesis as unpatentable threaten to exclude much of the inventive thrust of modern research. The *Mayo* patent eligibility requirement shifts scientists' efforts from the valuable scientific and technological advances that society seeks toward surmounting an amorphous test of unconventional application. Specific application as the test for patent eligibility better serves the modern scientific and technological age.

The extent of disruption will depend, of course, on the contours of the inventive application doctrine. Nonetheless, history provides an abject lesson. After the Court's sharp departure from prior patent eligibility standards in *Funk Brothers*, erratic application of the inventive application test by the lower courts led to the invalidation of patents that were unquestionably within the technological arts, and very arguably the precise innovations that the patent system sought to promote. See Lefstin, *supra*, at 66-70. Justice Frankfurter presciently anticipated these problems:

> It only confuses the issue . . . to introduce such terms as 'the work of nature' and the 'laws of nature.' For these are vague and malleable terms infected with too much ambiguity and equivocation. Everything that happens may be deemed 'the work of nature,' and any patentable composite exemplifies in its properties 'the laws of nature.' Arguments drawn from such terms for ascertaining patentability could fairly be employed to challenge almost every patent.

Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 134-35 (1948) (Frankfurter, J., concurring).

While the Court acknowledged concerns that ignoring all laws of nature risks eviscerating patent protection in *Mayo*, 132 S. Ct. at 1293-94, 1304, the inconsistency with which lower courts invoked the inventive application test in the years following *Funk Brothers* serves as a warning that inventive application is an imprecise and unpredictable instrument with which to implement the policies underlying subject matter eligibility. Moreover, relying on this Court's seeming repudiation of *Flook* in *Diehr*, neither the Patent and Trademark Office nor the courts have been employing a test of inventive application since this Court decided *Diehr*. Consequently, a revival of the inventive application test casts doubt on the patent-eligibility of many claims less objectionable than the ones this Court confronted in *Mayo*. See, e.g., *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 2013 WL 5863022 (N.D. Cal. Oct. 30, 2013) (invalidating claim to new test for prenatal screening of genetic abnormalities because application was evident in light of patentee's discovery).

Beyond its potential to destabilize the patent regime in particular fields of technology, the contours and nature of an inventive application doctrine open up a host of complex case management challenges. The inherent nature of a patent *eligibility* inquiry implies that it serves as a threshold doctrine. Thus, trial courts would need to confront this question early in the case management process. Yet it remains uncertain what sorts of evidence would be necessary to make a threshold determination. Courts would likely need to hear from expert witnesses to determine what is "well-understood, routine, conventional activity," *Mayo*, 132 S.Ct. at 1299, presumably as of the time that an invention was made. This could entail substantial discovery. Furthermore, factual disputes would presumably need to go to a jury. If done at a full trial on the merits, juries could easily be confused disentangling the threshold patent eligibility inquiry of inventive application from the already challenging determination of non-obviousness under 35 U.S.C. § 103. If the test for patent eligibility is bound to a fact-intensive inquiry into the state of the art and the capability of workers in the field, then it will only add to the notorious cost and complexity of patent litigation, rather than permitting early resolution of cases involving claims to patent-ineligible inventions.

Decrying the preemptive effects of protecting applications of scientific discoveries contradicts the very mechanism by which the patent system operates: the granting of exclusive rights to inventors. The constitutionally appropriate means of addressing such concerns is through legislative reforms. Extrapolation of amorphous, macroscopic patent eligibility limitations to exclude microscopic scientific and technological discoveries from the scope of patentable subject matter perpetuates the confusion surrounding patent eligibility and undermines the development of a coherent system for claiming modern advances. A coherent patent system requires clear standards that focus on the object of scientific and technological research, not the conventionality of their implementation. A relatively uniform patent system will inevitably result in over- and under-protection across its many domains, but Congress is the constitutionally and institutionally appropriate body to steer the course.

Yet even the legal foundation for non-textual patent eligibility standards remains unclear. The Court has never articulated the basis for such doctrines. Are they constitutionally based – derived from a constitutional requirement of invention? Are they based on an interpretation of the Patent Act? Or are they merely "common law" in nature? At a minimum, the Court should clarify such questions in order to enable Congress to know the limits of its power in patent system reform.

Based on a modern agnostic understanding of scientific and technological progress and the Patent Act, we believe that patent eligibility should turn on two inquiries: (1) whether patent claims fall within the useful arts (a constitutional constraint), see *Bilski*, 130 S. Ct. 3218, 3231-57 (Stevens, concurring); Peter S. Menell, Forty Years of Wondering in the Wilderness and No Closer to the Promised Land: *Bilski*'s Superficial Textualism and the Missed Opportunity to Return Patent Law to its Technology Mooring, 63 Stan. L. Rev. 1289 (2011); and (2) whether claims apply scientific principles to specific problems – i.e., barring abstract claims (a statutory constraint). The former ensures that business competition, athletic techniques, expressive works, and other non-technological fields do not become encumbered by patents, a regime intended to promote technological innovation. The latter addresses concerns about overbroad patent scope. See Mark A. Lemley, Michael Risch, Ted Sichelman, & R. Polk Wagner, Life After *Bilski*, 63 Stan. L. Rev. 1315 (2011).

None of this is to suggest that clarifying these principles will effectuate an ideal system for promoting progress in the useful arts. There is ample cause for deep policy reservations about overprotection of computer software. Much of that responsibility, however, lies outside the purview of the judiciary. Moreover, perpetuating incoherent and amorphous patent eligibility doctrines is not an effective means for addressing the larger problems of a flawed, one-size-fits-all patent system. To the contrary, such confusion exacerbates such problems by producing needless uncertainty at all stages of the system.

Rather than apply amorphous doctrines grounded in outdated scientific understanding, the Court should break from the *Funk Brothers*, *Flook*, and *Mayo* line of cases and focus attention on whether a claimed invention applies a discovery or invention to technological ends, leaving the statutory patentability doctrines of utility, novelty, non-obviousness, and adequate disclosure and scope (limiting protection to particular applications and barring abstract ideas) to serve as the principal screening filters. Such an approach respects the legislative judgment, since the nation's founding, to authorize patent protection for new and useful machines and improvements thereof. Computers unquestionably fall within that domain. Computer software serves as the gears and levers of such machines. To treat algorithms embodied in patent claims as part of the prior art contradicts long-standing legislative authorization for machine-based patents. Under existing law, a claim embodying computer software should be eligible for patent protection so long as it applies a discovery or invention to technological ends.

That said, the patents at issue in this case fail because they do not advance the technological arts – they do not contribute to machine technology or serve a technological function. As Justice Stevens's concurrence in *Bilski* explains, the U.S. Constitution limits Congress's patent power to inventions that promote the useful arts. See Peter S. Menell, Forty Years of Wondering. Business methods, even if implemented in a computer, are not eligible for patent protection. Form should not trump substance. Unless the method advances the functioning of the computer or serves a technological function – as opposed to a business purpose – then it is excluded from the scope of patentable subject matter.

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CONCLUSION

Just as "[i]t is revolting to have no better reason for a rule of law than that so it was laid down in the time of Henry IV" and "still more revolting if the grounds upon which it was laid down have vanished long since, and the rule simply persists from blind imitation of the past," Oliver Wendell Holmes, Jr., The Path of the Law, 10 Harv. L. Rev. 457, 469 (1897), it may be worse to perpetuate doctrines grounded in misapprehended, inchoate, religion-tinged views of science held in the time of George III. The ambiguous provenance of these doctrines, their common law character, and their unworkability justify moving to more coherent eligibility principles.

Aligning patent eligibility with modern agnostic scientific understanding would bring clarity to the patent system, thereby enabling inventors, competitors, patent examiners, jurists, legislators, and the public to assess patent eligibility with reasonable confidence.

References to the storehouse of knowledge available to all confuse the inquiry. The statement that a claim for patentability "is weaker than the (patent-eligible) claim in *Diehr* and no stronger than the (unpatentable) claim in *Flook*," *Mayo*, 132 S. Ct. at 1299, without any explanation of how *Diehr* and *Flook* can be reconciled affords little guidance to the many constituencies seeking to assess patent eligibility. The appropriate eligibility inquiry should focus simply on whether a patent claim applies a discovery or invention to technological ends.

It should be acknowledged, however, such simplification of patent eligibility standards would not solve many of the other serious problems plaguing the patent system. But it would eliminate incoherent, unworkable, and obsolete constructs that destabilize the patent system. Perhaps more importantly, jettisoning the "law of nature" inquiry might galvanize Congress and the Executive Branch to pursue patent reforms aimed at the root causes of the patent system's problems.

The best way to address the software patent crisis lies not in philosophical inquiry about whether an inventor has contributed a sufficient "inventive concept" beyond an algorithm or scientific principle but in carefully considered policy reforms. Promising ideas include: legislation to address patent-related distortions in software markets (e.g., an independent invention defense, shorter duration for software-based inventions, expanded and expedited Patent Office review of software patents); legislation to promote cumulative innovation (such as broader scope for experimental use); initiatives to improve the quality of Patent Office determinations, enhance notice (claim clarity, ownership transparency, and tools for assessing freedom to operate), and address problems within the patent litigation system; legislation to balance litigation (fee shifting, alterations to the presumption of validity with regard to prior art that was not considered by the Patent Office); and contractual restrictions on the exploitation of patents funded through public research grants. The courts have other opportunities to make measured adjustments – as reflected in pending consideration of the patent indefiniteness doctrine and innovations in patent case management – but reviving an incoherent, amorphous, and outdated patent eligibility standard moves the law in the wrong direction.

Respectfully submitted,

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BRIEF OF AMICUS CURIAE PAUL R. MICHEL IN SUPPORT OF NEITHER PARTY

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INTEREST OF THE AMICUS CURIAE[1]

Amicus Curiae Paul R. Michel is the only living retired Chief Judge of the United States Court of Appeals for the Federal Circuit, the review tribunal for essentially all patent validity rulings. Judge Michel has a strong interest in offering neutral advice to the Court on construing the Court's implied exceptions to the patent statute regarding eligibility so as to advance innovation, here particularly in connection with computers, computer-implemented inventions, and computer software operating on a general purpose computer. On the basis of his service on the court for over 22 years, hearing thousands of patent appeals, he may have insights of use to the Court.

SUMMARY OF THE ARGUMENT

For the future of the country, it is essential to advance the constitutional purpose of promoting the progress of science and useful arts through the patent system by supporting innovation in computers and computer programs. U.S. Const. Art. I, § 8, cl. 8.

Congress intended statutory patent eligible subject matter to include "anything under the sun that is made by man." *Diamond v. Chakrabarty*, 447 U. S. 303, 309 (1980).

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[1] No counsel for a party authored this brief in whole or in part, and no such counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than the *amicus curiae* or his counsel made a monetary contribution to its preparation or submission. *Amicus* understands that Petitioners and Respondents have both consented to the filing of amicus briefs in this appeal.

The claims are the sole measure of the patent grant, *Aro Mfg. Co. v. Convertible Top Co.*, 365 U.S. 330, 339 (1960), and must be considered as a whole in determining eligibility of claimed inventions under section 101; it is inappropriate to dissect the claims into old and new elements and then ignore the presence of the old elements in the analysis. *Diamond v. Diehr*, 450 U.S. 175, 188-89 (1981).

The criteria for patent-eligibility should exclude only clearly ineligible inventions, allowing the other sections of the Patent Act—sections 102, 103 and 112 on conditions of patentability—to perform their respective functions.

ARGUMENT

I. COMPUTER INNOVATION IS MORE IMPORTANT TODAY THAN EVER BEFORE

It can hardly be doubted that the availability of patent protection for computer hardware contributed significantly to the astounding advances in computer science and the increasing importance of computers celebrated when TIME Magazine named the computer Man of the Year for 1982. It is no less important today, more than 30 years later, in supporting continuing and escalating innovation in computer technology, for both computer hardware and computer software. Indeed, it is vastly more important. Computers pervade American life today and enable inventions in every other technology, holding promise to improve daily life in every imaginable way, particularly in eliminating diseases and disabling conditions that have plagued humans for millennia.

The computer and the software controlling it impact every person through incorporation into vehicles on land, sea, air, below the sea, and in space; communications devices that realize recent science fiction; and innumerable devices in virtually every other important field of human activity. For the future of the country, it is essential to advance the constitutional purpose of promoting the progress of science and useful arts through the patent system by supporting innovation in computers and computer programs. U.S. Const., Art. I, § 8, cl. 8.

Along with the advance of computers into everyday life has come an inability to draw lines between what is or is not a computer, what is or is not software, what is or is not a "business" method as opposed to a "technical" method. All other sorts of bright line-drawing have similarly become virtually or wholly impossible. It was with a certain understanding of the importance of fostering advancing technology and refusing to draw bright lines that exclude new technologies that Congress approached its drafting of Section 101, and this Court, for the most part, has recognized such broad application.

II. CONGRESS INTENDED STATUTORY PATENT ELIGIBLE SUBJECT MATTER TO INCLUDE "ANYTHING UNDER THE SUN THAT IS MADE BY MAN" AS MEASURED AGAINST THE CLAIMS AS A WHOLE

In *Diamond v. Chakrabarty*, the Court observed:

> The Committee reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." S. Rep. No.1979, 82d Cong., 2d Sess., 5 (1952); HR. Rep. No.1923, 82d Cong., 2d Sess., 6 (1952).

447 U.S. 303, 309 (1980).

The Court adhered to this perspective in *Diamond v. Diehr*, 450 U.S. 173, 182 (1981), when holding that, in assessing eligibility under Section 101 of the Patent Act, claims are not to be dissected, as occurred in *Parker v. Flook*, 437 U.S. 584 (1978), but to be evaluated "as a whole." *Flook* was in that regard an aberration, for the Court had long assessed compliance with all requirements of the Act by analyzing the claims in view of all their limitations together.

This Court and the Federal Circuit have also repeatedly emphasized that the claims are the sole measure of the patent grant. For example, in *Aro Mfg. Co. v. Convertible Top Co.*, the Court emphasized the preeminence of the claims in defining the actual invention:

> Since the patentees never claimed the fabric or its shape as their invention, and ***the claims made in the patent are the sole***

> ***measure of the patent grant***, the fabric is no more than an unpatented element of the combination that was claimed as the invention.

365 U.S. 336, 339 (1961) (internal citations omitted).

This Court and the Federal Circuit look to the patent specification to understand the claims, but the claims are ultimately what controls:

> It is a "bedrock principle" of patent law that "the claims of a patent define the invention to which the patentee is entitled the right to exclude." That principle has been recognized since at least 1836, when Congress first required that the specification include a portion in which the inventor "shall particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery." Act of July 4, 1836, ch. 357, § 6, 5 Stat. 117, 119. In the following years, the Supreme Court made clear that the claims are "of primary importance, in the effort to ascertain precisely what it is that is patented." *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876). Because the patentee is required to "define precisely what his invention is," the Court explained, it is "unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms." *White v. Dunbar*, 119 U.S. 47, 52 (1886)....

Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (Federal Circuit citations omitted).

III. IN DETERMINING ELIGIBILITY OF CLAIMED INVENTIONS UNDER §101, THE CLAIMS MUST BE CONSIDERED AS A WHOLE; IT IS INAPPROPRIATE TO DISSECT THE CLAIMS INTO OLD AND NEW ELEMENTS AND THEN IGNORE THE PRESENCE OF THE OLD ELEMENTS IN THE ANALYSIS

In *Diamond v. Diehr*, the Court, emphasized that the claim as a whole should be considered for Section 101 analysis, and that claims cannot be divided into old and new parts for the analysis:

> In determining the eligibility of respondents' claimed process for patent protection under §101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. The 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the §101 categories of possibly patentable subject matter.

450 U.S. at 188-89. To that end, the Court overruled statements to the contrary in the aberrational *Parker v. Flook*, 437 U.S. 584 (1978).

This warning is particularly important when applying this Court's non-statutory exceptions to

Section 101. Those exceptions focus on whether a claimed invention "preempts" all uses of a law of nature or abstract idea, or whether it recites nothing more than "conventional" or "obvious" variants of a law of nature or abstract idea. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. __ (2012). If a claim can be sliced-and-diced, however, it is likely that each element of the claim is, by itself, old and conventional, and is preemptive of a truly broad range of implementations, as no one works from scratch but God. Similar dangers arise when attempting to shoehorn a claim with many elements into an oversimplified, core idea behind the invention, rather than recognizing every one of the claim elements as important in defining the invention.

The reference in *Bilski v. Kappos*, 561 U.S. 130 (2010), to "abstractness" as a ground of ineligibility for computer-related claims amplifies this problem and sets out a dangerous road to travel. "Abstractness" is a vague and subjective notion that has proven entirely unworkable, and unavoidably yields inconsistent and unpredictable results in the hands of 7,000 examiners and some 1,000 district judges, not to mention the countless thousands of patent attorneys, inventors, business leaders, and investors who need to interpret the law when making decisions about investing in patents, licensing, and funding or settling litigation.

Clearer lines are urgently needed and can only be provided by this Court as the creator and arbiter of the judicially-created "exceptions" to statutory patent eligibility, including "abstract ideas," whatever that means.

A better analysis would produce an administrable standard. It is suggested that software algorithms, if specifically disclosed, should themselves impart patent eligibility when claimed together with a computer. So should software that effectively makes a general-purpose computer into a specialized computer (a "machine"). Such features certainly turn a mere abstraction into a real-world implementation, and the concept of "abstractness" should not be extended any further than that, lest its edges blur entirely and lead to more confusion in the courts and the bar.

Nor should the Court rely on statements in its two recent life-science Section 101 cases *Mayo v. Prometheus*, 566 U.S. __ (2012) and *Ass'n For Molecular Pathology v. Myriad Genetics, Inc.*, __ U.S. __ (2013), beyond those statements' applicable bounds, lest they be applied in a manner that does not fit the realities of computer technology. The language of those cases has been read to sanction dissection of claims into relevant and irrelevant limitations, contrary to *Diehr*. Such an approach is particularly unsuitable in computer cases because any software solution can be described at high levels that will necessarily be abstract, and lower levels that will not. Dissection of software claims inexorable leads to a too-abstract characterization of the invention, then directly to "abstractness," and then to invalidity for the claims, whether that is the deserved result or not.

In addition, these opinions have been interpreted as assuming that only eligibility under Section 101 can perform the task of weeding out over-broad patents, to the exclusion of obviousness under Section 103. Their language conflates the inquiries under Sections 101 and 103—e.g., speaking of "obvious and conventional" features of an invention—and to the extent that such was not intended, *amicus* urges the Court to clarify its statements about "conventional" and "obvious" steps.

In any event, whether such notions were helpful to deciding those particular cases is immaterial because any such assumptions are unhelpful and potentially hurtful in computer cases. They can lead to arguments that particular features of a claim are not new or are obvious (when the real inquiry is whether the claim as a whole is new or nonobvious, and Congress decreed that such inquiry is under Sections 102 and 103). And they can lead to inevitable abstracting of an otherwise patent-eligible claim via the removal of any individual elements deemed conventional, and the question of whether the little that remains is abstract or not.

Therefore, the Court should return to its seminal precedent in *Diehr*, a computer case, which provides the best approach. Any recourse to the aberrational approach of *Flook* or the unworkable notion of relative abstractness of *Bilski* will complicate, confuse, and confound the patent law. It would also cripple, if not destroy, computer-related industries, of which there are many and which are vital to the future of the country in today's highly competitive global economy.

IV. FOLLOWING THE ENTIRE CLAIM APPROACH FOR PATENT ELIGIBILITY WILL ASSIST APPLICANTS, THEIR ATTORNEYS, AND PATENT EXAMINERS IN WORKING TOGETHER TO DEFINE SUBJECT MATTER PROPERLY REGARDED AS PATENT ELIGIBILE

Of special importance to any decision by the Court is providing concrete, yet tolerant, guidance to patent applicants, their attorneys, and patent examiners at the entrance to the patent system so that they can work together to properly define computer technology inventions for which patent protection is sought.

"'The days of an adversarial relationship with patent applicants are over," former Patent and Trademark Office Director David J Kappos told an audience of academics, practitioners, and a few of his employees, during his recent term. 79 Patent, Trademark & Copyright J. 101 (Nov. 27, 2009). In his first few months in office, Kappos said that "[he] had repeatedly instructed examiners to help applicants find patentable subject matter." *Id.*

But the high promise of broad benefit inherent in this approach cannot be realized unless the Court provides criteria more useful than, in effect, simply saying: "avoiding excessive 'abstractness.'" What is needed is drawing lines that are objective and categorical, not matters of degree that are inherently unknowable until many years after a patent has issued and has been enforced (at great expense to the patentee, the courts, and the targets of enforcement). At that point in time, it is too late, when some appellate judges finally resolve the mystery involved in the futile up-front effort of trying to apply indeterminate eligibility criteria.

The criteria should exclude only clearly ineligible inventions, allowing the other sections of the Patent Act—sections 102, 103, and 112 on conditions of patentability—to perform their respective functions. It is hard enough for the public, examiners, and judges to determine the bounds of "abstractness" when that term is kept close to home, where its edges can be kept sharp. But if the Court lets the concept spread and its edges bleed and blur, neither computer innovation nor the public at large will benefit. Instead, spreading and dilution of the doctrine will result in uncertainty and attendant commercial expense—to patent owners attempting to craft definite claims, to third parties trying to determine what they can and cannot do, and to courts and litigants waiting to see what the final word is in this very complex area.

CONCLUSION

Amicus submits that claims are first to be examined or reviewed for eligibility under Section 101 considering all their limitations, and then examined or evaluated in like manner for indefiniteness, enablement, and adequate description under §112, novelty under §102, and meeting the ultimate condition for patentability of non-obviousness under §103. Implied exceptions should be used only for clear cases of patent claims that would preempt basic and fundamental technological building blocks.

Respectfully submitted.

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AMICUS
CURIAE
BRIEF

No. 13-298

Supreme Court, U.S.
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IN THE
Supreme Court of the United States

ALICE CORPORATION PTY., LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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BRIEF OF MICROSOFT CORPORATION, ADOBE SYSTEMS INC., AND HEWLETT-PACKARD COMPANY AS *AMICI CURIAE* IN SUPPORT OF AFFIRMANCE

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QUESTION PRESENTED

Whether the courts below correctly concluded that none of the asserted claims are patent eligible under 35 U.S.C. § 101.

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BRIEF OF MICROSOFT CORPORATION, ADOBE SYSTEMS INC., AND HEWLETT-PACKARD COMPANY AS *AMICI CURIAE* IN SUPPORT OF AFFIRMANCE

INTEREST OF *AMICI CURIAE*[1]

Microsoft Corporation is a leader in the technology industry and an active and longstanding player in the patent system. Since its founding in 1975, it has developed and marketed a wide range of software, services, and hardware products, including the flagship Windows operating system, the Office suite of productivity applications, the Surface tablet computer, and the Xbox gaming system.

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[1] Pursuant to Supreme Court Rule 37.6, counsel for *amici curiae* states that no counsel for a party authored this brief in whole or in part, and no party or counsel for a party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amici* or their counsel made a monetary contribution to this brief's preparation or submission. Counsel of record for both petitioner and respondents have consented to the filing of *amicus* briefs in letters that have been filed with the Clerk.

Adobe Systems Inc. is devoted to changing the world through digital experiences. With its over 30-year history in the software and services fields, and flagship products like Photoshop, Acrobat, Flash, and Adobe Marketing Cloud, Adobe provides the tools the world uses to create groundbreaking digital content, deploy it across all screens, measure and optimize it over time, and achieve greater business success.

Hewlett-Packard Company is the world's largest information technology company. It offers personal computers, enterprise storage and servers, networking devices, IT management software, IT services, and imaging- and printing-related products.

The question presented in this case purports to concern the patent eligibility of computer-implemented inventions. The patents at issue, however, do not claim true computer-implemented inventions, but instead claim business methods for mitigating risk in financial transactions. *Amici* have a profound interest in ensuring that courts understand the differences between the two. As leading technology companies, *amici* currently spend $14 billion annually on research and development and hold nearly 63,000 U.S. patents, most of which relate to computer-implemented inventions. *Amici* are also frequently sued for allegedly infringing business-method patents, some of which, like the claims in this case, masquerade as computer-implemented inventions. *Amici* thus have unique and balanced insights on, and experience with, the issues presented by this case.

INTRODUCTION AND SUMMARY OF ARGUMENT

Petitioner frames the question presented as "[w]hether claims to computer-implemented inventions * * * are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101" (rather than being categorically excluded as abstract ideas). Pet. Br. i. That question has an easy, but superficial, answer: yes. But the actual question is whether petitioner's patent claims, which are directed to abstract business methods, qualify as "computer-implemented inventions" eligible for patent protection. The answer to that question is no.

Petitioner's patents claim a method of performing escrows—an otherwise unpatentable business method—to which petitioner has essentially bolted on the directive "perform that method on a computer." But merely saying, "perform an otherwise unpatentable idea on a general-purpose computer" does not make the idea patentable. In *Bilski* v. *Kappos*, 130 S. Ct. 3218 (2010), the Court held that the abstract idea of hedging was not patentable. Adding the directive to do the hedging "on a computer" would not have changed that result. The same is true here.

I. Precisely because this case does not involve a true computer-implemented invention (but rather a business method posing as one), the Court has no reason to address—or to risk the potential uncertainty and unforeseen impacts that can be created by addressing—the patentability of computer-implemented inventions and software generally. The importance of software to the progress of innovation and the economy cannot be overstated. Software provides the infrastructure for innovation in today's information age. Computers of all types rely for their operation on the same physical activity—turning millions of tiny transistors, embedded in silicon chips, on and off in the desired sequences. It is software that defines the operation of a computer's transistors. By controlling those transistors, software can enable a single general-purpose computer to function as a camera, a telephone, a video player, a gaming device, and more.

Previously, most patentable inventions took the form of new, single-purpose mechanical devices, or improvements to existing physical mechanisms. Today, many technological inventions—both pioneering discoveries and incremental improvements—rely not on advances in mechanical design, but on advances in the software that controls computer hardware. These digital advances are the heirs to their mechanical forebears—they are no less innovative, and they serve the same practical function in advancing the state of technology. The fact that they take the form of a process implemented through software's reconfiguration of transistors, rather than modifying the physical structure of a machine, does not make them any less patent eligible.

Software-based innovation pervades every sector of the economy. In the aerospace and automobile industries, innovations like fly-by-wire controls and anti-lock brakes are not so much the product of mechanical evolution as of software advances. Such computer-implemented innovations have been considered, and should remain, just as patent eligible as their mechanical predecessors.

II. Petitioner's patents in this case cover a "business method" of the sort this Court held to be an unpatentable abstract idea in *Bilski*. While some of petitioner's claims do refer to a computer or computer implementation, none relates to an advance in computing, software, or any other technology. Nor do the claims represent an innovation in how a computer may be employed to produce the desired result. Instead, the claims recite an abstract idea for conducting a business transaction and then add what amounts to the directive, "do it on a computer." Petitioner's patents are no more directed to a computer-implemented innovation for electronic transactions than a generic claim for a "molecule configured to cure cancer" describes a novel pharmaceutical for treating oncology patients.

"[T]o transform an unpatentable law of nature into a patent-eligible *application* of such a law, one must do more than simply state the law of nature while adding the words 'apply it.'" *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2011). Likewise, to transform an otherwise unpatentable business method into a patentable computer-implemented invention, one must do more than say "do it on a computer." See *Parker* v. *Flook*, 437 U.S. 584, 593 (1978). To resolve this case, the Court's decision need not, and should not, go further.

III. This Court's § 101 cases provide well-suited threshold tests for filtering out unpatentable business-method patents, including those disguised as computer-implemented inventions. But applying them to true computer-implemented inventions may prove harder in future cases. Assessing the eligibility of software-related claims often presents difficult issues and unique concerns. The Court should not purport to issue guidelines for such claims in the absence of a record that will help the Court evaluate those complexities.

In the meantime, courts can continue to address the patent eligibility of computer-implemented inventions with reference to established § 101 principles. Those principles require courts to consider the actual patent claims themselves, taken as a whole. And they establish that a claim invoking abstract concepts is patent eligible only if it also contains additional limitations that direct the claim to a specific, practical application of the idea—an invention that advances computer functionality or represents a new way to use a computer to achieve a result—rather than attempting to monopolize the idea itself.

ARGUMENT

I. SOFTWARE-IMPLEMENTED TECHNOLOGICAL INNOVATIONS ARE PATENT ELIGIBLE UNDER § 101

A. Software Makes Computing Technology Work

It is natural to envision innovation in computing technology in terms of hardware, as each generation of smartphones, tablets, and laptops is faster, more powerful, and more feature-rich than predecessors. And advances in computer hardware—exemplified by increases in processing power pursuant to Moore's law[2]—abound. Ultimately, however, software underlies the varied functionality and practical utility that computers provide. Without software, computers can do nothing useful. As a result, software is an indispensable aspect of innovation in every technological field and sector of the economy.

Despite the countless types of computing devices, they all operate using the same simple physical activity: the routing and re-routing of electrical signals by means of on-off switches, typically transistors on silicon chips. See generally David A. Patterson & John L. Hennessy, *Computer Organization and Design* (4th ed. 2009); Ron White, *How Computers Work* (9th ed. 2008). While difficult to visualize, the complex functions that computers perform come down to the rapid manipulation of millions of transistors in particular configurations.

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[2] "Moore's law" is the prediction that "[t]he number of transistors incorporated in a [semiconductor] chip"—and, roughly, the processing power of chips—will "double every 24 months." *Moore's Law and Intel Innovation*, http://www.intel.com/content/www/us/en/history/museum-gordon-moore-law.html.

Software defines the operations of those transistors. Software developers conceive of the functionality they want a computer to perform, and then write instruction code using a "programming language" that allows operations to be defined through syntax and semantics that humans can readily understand. But the functions developed in programming language must then be reduced to "machine language," which provides instructions at the rudimentary level of turning the computer's transistors on and off in the desired sequences. See Patterson & Hennessy, *supra*, at 11-13, 20-21, 76-80.

Different software programs enable a general-purpose computer to perform new and different tasks. "Such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." *In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994) (en banc). Simply put, it is software that transforms the single set of circuits in a general-purpose computer into a word processor, camera, telephone, video player, or gaming device. Where formerly inventors had to build new devices, software can endow a single computing device with new features, capabilities, and advances in performance by reconfiguring the device's existing transistors.

B. Software-Enabled Inventions Are the Modern-Day Heirs to Mechanical Inventions

Software innovations are the modern-day heirs to unquestionably patent-eligible mechanical inventions—they are precisely the sort of "new and useful advances in technology" that the patent system was designed to encourage and protect. *Pfaff* v. *Wells Elecs., Inc.*, 525 U.S. 55, 63 (1998). The fact that technological advances may take the form of software reconfiguring a computer's transistors, rather than an improvement in the mechanical structure of a machine, does not make them any less patent eligible.

The technological evolution from mechanical typewriter to today's word-processing software illustrates that point. Christopher Latham Sholes did not invent the typewriter, but he developed the first commercially viable one. In 1868, he received a patent for his "Improvement in Type-Writing Machines." At that time, typewriters were purely mechanical devices. Sholes' innovations were likewise mechanical: They included "a better way of working the type-bars," "of moving and regulating the movement of the carriage," and "of holding, applying, and moving the inking-ribbon." U.S. Patent No. 79,265, at 1 (issued June 23, 1868).

Other innovations followed—they, too, were patent-eligible "new and useful improvement[s]" in a typewriter's mechanics. 35 U.S.C. § 101. The capital-shift function allowed users to toggle between upper- and lower-case characters on a single type bar. Several patents were awarded in the late 19th century for implementations of a capital-shift mechanism. *E.g.*, U.S. Patent Nos. 202,923 (issued Apr. 30, 1878), 551,842 (issued Dec. 24, 1895), 564,699 (issued July 28, 1896). And the invention of a mechanism for proportional spacing, which adjusts the distance between letters in proportion to their varying widths, produced more aesthetically pleasing typesetting. See U.S. Patent No. 2,111,410 (issued Apr. 15, 1935).

In the 1930s, incorporation of electric motors increased typewriters' speed. Several patents for that technology were issued to Russell Thompson of Electromatic Typewriters, Inc. See, *e.g.*, U.S. Patent Nos. 1,940,155 (issued Dec. 19, 1933), 2,063,530 (issued Dec. 8, 1936). IBM acquired Electromatic, using its patents to produce the first commercially successful electric typewriter. See *The History of IBM Electric Typewriters*, http://www.03.ibm.com/ibm/history/exhibits/modelb/modelb_history.html. IBM further advanced the art in the 1960s with its Selectric typewriter, replacing the movable carriage and individual typestrikers with a golf-ball-shaped revolving printing head. See U.S. Patent No. 2,895,584 (issued July 21, 1959).

In the 1970s, typewriters began shifting to digital technology, as companies developed single-purpose word-processing computers. Lexitron, for example, patented an "Electronic Text Display and Processing System" that included a display, a memory, a processor, and a keyboard. U.S. Patent No. 3,810,107, col.1, ll.50-57 (issued May 7, 1974) ("'107 Patent"). Functionality previously achieved through gears and levers—like proportional font spacing—was re-developed using software that provided instructions to computing hardware. Those digital improvements served the same function as, and were no less technologically innovative than, their mechanical forebears. Accordingly, the inventions were patentable. See, *e.g.*, U.S. Patent No. 3,654,609 (issued Apr. 4, 1972).

Digital word processors also introduced entirely new features. Early word-processing devices allowed operators to edit text on a display before committing it to paper. See, *e.g.*, '107 Patent, col.1-2. Later inventions utilized software to identify misspellings and recommend corrections. See U.S. Patent No. 4,859,091, col.1 (issued Aug. 22, 1989).

Today, word-processing software runs on general-purpose computers. Manufacturers no longer need to design customized devices for different uses. Instead, software applications tailored to different specialties—like Microsoft Word for business documents, Adobe Acrobat for printed brochures, and Sublime Text for software code—transform the same general-purpose computer into a specialized word-processing device. See *Alappat*, 33 F.3d at 1545. In a mechanical typewriter, an etched piece of metal stamped a letter on paper. Now, software renders that letter so it will appear on a pixel-oriented LCD display or print on a printer. See U.S. Patent No. 5,740,456, col.1 (issued Apr. 14, 1998).

Other software-implemented advances in word processing have no analog in the mechanical typewriter. Today's word-processing software can spell-check documents without human input; automatically correct text; call up a graphical interface integrating e-mail functionality within the word-processing application; and even create web pages. Our system has rightly encouraged and rewarded these software-implemented inventions through patents. See U.S. Patent Nos. 5,787,451 (issued July 28, 1998), 5,761,689 (issued June 2, 1998), 6,405,225 (issued June 11, 2002), 7,340,675 (issued Mar. 4, 2008).

C. Software Advances Pervade Today's Technological Landscape

As the story of the typewriter demonstrates, many types of technological advances that once were achieved by changing the device's physical structure are now implemented through advances in software. Software drives more than general-purpose computers like PCs and tablets. Programmable microchips—and the software that runs them—are now standard components in everything from mobile phones to washing machines. Software enables improvements and new capabilities in countless devices, without requiring changes to the machinery the software operates.

The reach of software-based technological advances thus extends far beyond the "software" industry. The aerospace industry has played a leading role. "Often expensive new uses of computing would be developed" in the aerospace sector, "and then later transferred to other industries." James W. Cortada, *The Digital Hand: How Computers Changed the Work of American Manufacturing, Transportation, and Retail Industries* 154 (2003). For example, an "American fighter of World War II could be built on the basis of roughly 8,000 blueprints." *Id.* at 155. By the 1960s, "a military plane required between 50,000 and 100,000 drawings." *Ibid.* The Industry developed "automated drafting tools" to keep pace. *Ibid.* Later, the development of computer-assisted design software programs ("CAD") enabled engineers to "simulat[e] design, stress, [and] performance of materials" before ever building prototypes. *Ibid.*

Software transformed not only aerospace design, but the vehicles themselves. One example is "advanced vehicle control software." Cortada, *supra*, at 154. Aircraft once were operated through mechanical controls. When the pilot made a steering adjustment by moving the yoke, a series of cables and connectors would physically relay the pilot's movements to airplane control surfaces (the ailerons, elevator, and rudder). James E. Tomayko, *Computers Take Flight: A History of NASA's Pioneering Digital Fly-By-Wire Project* 11-12 (2000), http://www.nasa.gov/centers/dryden/pdf/182985main_DFBW_rev1.pdf. Later, hydraulic systems were used.

They amplified the force applied, but they still utilized physical links connecting the yoke to the control surfaces. Those have now given way to computer-controlled "fly-by-wire" systems. Dating to the computerized systems used in the Apollo spacecraft, fly-by-wire technology first appeared in an airplane in 1972 in NASA's F-8 Crusader. *Id.* at viii, 16-19.

When the pilot moves the yoke in a fly-by-wire system, it feeds data into a computer that then adjusts the control surfaces. Tomayko, *supra*, at 11-12. The computer can execute faster, finer, and more frequent adjustments than a human pilot ever could. *Ibid.* Fly-by-wire control yields enormous benefits, including lower airframe weight, increased fuel efficiency, improved handling and responsiveness, and greater safety. *Id.* at viii. Fly-by-wire is now used in everything from commercial airliners, to military fighter jets, to the Space Shuttle Orbiter. *Id.* at vii, 127-128.

Software-driven innovations originating in the aerospace industry have rapidly spread to the automotive industry. Cortada, *supra*, at 154. Everything from the initial design, to production, to the end-product cars themselves has been improved by innovations in software.

Until the 1960s, engineers designed cars by making hand-drawn sketches. Today, engineers use CAD programs. Michael Tovey *et al.*, *Sketching and Direct CAD Modelling in Automotive Design*, 21 Design Studies 569, 570-571 (2000). Three-dimensional computer modeling helps designers hit their targets for styling, energy efficiency, cost, and safety. John Brandon, *How Computers Have Revolutionised Our Cars*, TechRadar (July 4, 2013), http://www.techradar.com/us/news/car-tech/how-computers-have-revolutionised-car-design-1160141; Alan

Cane, *Car Manufacturing: Vehicle Makers Appreciate the Virtues of Virtual Design*, Financial Times (May 28, 2008), http://www.ft.com/cms/s/0/76265d22-2af8-11dd-a7fc-000077b07658.html#axzz2tL1PQkhN.

Automobile assembly was originally purely manual and mechanical. When Henry Ford introduced the Model T in 1908, workers carried components to a stationary chassis, manually attaching each piece. See Paul Ingrassia, *This Car Changed America*, The Wall Street Journal (Sept. 27, 2008), http://online.wsj.com/news/articles/SB122246777029780525. Even with Ford's introduction of the assembly line, production required an army of workers to physically bolt parts to the car frame as it moved past. That began to change in the 1960s when GM first installed an industrial robot in its Trenton, New Jersey plant. Int'l Fed'n of Robotics, *History of Industrial Robots* (2012), http://www.ifr.org/uploads/media/History_of_Industrial_Robots_online_brochure_by_IFR_2012.pdf. The technology proliferated, and computer-controlled industrial robots now perform welding, painting, and quality-control. See John Markoff, *Skilled Work, Without the Worker*, The New York Times (Aug. 18, 2012), http://www.nytimes.com/2012/08/19/business/new-wave-of-adept-robots-is-changing-global-industry.html?pagewanted=all&_r=0.

More recently, manufacturers "have realized that with the right software and safety controls," robots can "work in close proximity to humans." Will Knight, *Smart Robots Can Now Work Right Next to Auto Workers*, MIT Technology Review (Sept. 17, 2013), http://www.technologyreview.com/news/518661/smart-robots-can-now-work-right-next-to-auto-workers/. Thus, the "collaborative robot"—or "cobot"—now works alongside humans, maximizing efficiency and quality. See Eric Rogell, *Car-Building Robots with Laser Eyes Can "See" Exactly Where to Place Parts for Custom-Like Fit*, Discovery News (Apr. 12, 2012), http://news.discovery.com/autos/drive/national-robotics-week-car-building-robots-with-laser-eyes-can-see-exactly-where-to-place-parts-for-custom-like-fit.htm. As a result, the same factory that required 5,000 workers in the 1960s now requires a workforce of only 1,500.

Today, cars themselves are essentially "rolling computers." Johannes Winterhagen, *Road to a Digital Future*, Pictures of the Future Magazine 64 (Fall 2012), http://www.siemens.com/innovation/apps/pof_microsite/_pof-fall-2012/_html_en/automotive-software.html. "Similar to computers and smartphones, electronic parts like sensors and microprocessors comprise the 'backbone' of today's cars." Auto Alliance, *Technologies Working Together: Autos, Computers and Electronics*, http://www.autoalliance.org/index.cfm?objectid=1D64C240-7EE5-11E3-9303000C296BA163. "Engines, transmissions, brakes, airbags, and even power windows are equipped with intelligent electronics." Winterhagen, *supra*, at 64. Computer-controlled, software-implemented "[d]river assist systems include lane departure and blind spot warnings, adaptive cruise control, automatic braking, telematics control systems and more." Auto Alliance, *supra*.

Onboard GPS receivers employ software to determine the car's location based on satellite signals. See National Geographic Education, *GPS*, http://education.nationalgeographic.com/education/encyclopedia/gps/?ar_a=1. Software also allows GPS devices to determine the best route, anticipate delays, and predict arrival time.

Software has also enabled new safety features. Antilock braking systems ("ABS"), for example, sense the rate of rotation of each wheel and use software to determine when a computer should apply the brakes to prevent wheel lock and ensure the driver maintains control of the car. AAA Foundation for Traffic Safety, *FAQs: Anti-Lock Braking System (ABS)*, (Feb. 15, 2005), https://www.aaafoundation.org/faqs-anti-lock-braking-system-abs. Stability-control systems similarly use software to monitor each wheel and make adjustments to maximize traction. Jamie Page Deaton, *Ask the Editor: What Is Stability Control?*, U.S. News & World Report (July 22, 2011), http://usnews.rankingsandreviews.com/cars-trucks/best-cars-blog/2011/07/Ask_the_Editor_Whats_Stability_Control. And computer-controlled crash-avoidance systems can "help drivers stay in their lanes" and even "brake automatically in critical situations." Winterhagen, *supra*, at 64. Those advances were primarily the result of software innovations, rather than advances in mechanical components. And the next level of software-driven advances—self-driving cars in which software can "read road signs and traffic signals" and "navigate roadways, traffic and pedestrian hazards"—is just around the corner. Auto Alliance, *supra*.

To fuel that innovation, the automotive industry spends $18 billion annually in the U.S. alone on research and development. Ctr. for Auto. Research, *Just How High-Tech is the Automotive Industry?* 1 (2014), http://www.autoalliance.org/auto-innovation/2014-car-report. Much of that research and development is directed toward software-enabled innovation. And auto makers rely on patents to protect those investments: "[A]pproximately 5,000 new patents per year" are awarded to companies in the automotive industry. *Id.* at 2.

The aerospace and automotive industries are but two examples of industries where software, as much as new mechanical components, drives innovation. Virtually every industry—from medicine[3] to law enforcement[4]—has been transformed. The vast majority of software-related patents today go not to traditional software companies, but to manufacturing companies that integrate software with their products. See James E. Bessen & Robert M. Hunt, *An Empirical Look at Software Patents*, 16 J. Econ. & Mgmt. Strategy 157, 171 (2007).

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Software provides the "infrastructure" of innovation in today's "information age." President's Info. Tech. Advisory Comm., Nat'l Coordination Office for Computing, Info. & Commc'ns, *Information Technology Research: Investing in Our Future* 23 (1999), available at http://research.microsoft.com/en-us/um/people/gray/papers/pitac_report_99_2_24.pdf. Where, as in the examples above, software plays an integral role in achieving a practical, technological effect, that computer-implemented invention should be just as patent eligible under § 101 as its mechanical forebears. The fact that a software-based technological invention achieves its result through instructions that manipulate transistors on a silicon chip does not make the invention any more "abstract" than if it were a new mechanical structure.

Precisely because software innovations play such a critical role in this Nation's economy and progress, the Court should take care not to "create uncertainty as to the patentability of" true computer-implemented inventions, like "software * * * and inventions based on linear programming, data compression, and the manipulation of digital signals." *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3227 (2010). Fortunately, this case does not require the Court to make pronouncements that could create such a destabilizing effect. As explained below, this case does not present the patentability of a genuine computer-implemented innovation. Instead, it presents the more pedestrian question whether an otherwise-unpatentable abstract business method can be rendered patentable simply by reciting a directive that it should be performed on a computer. Because the answer to that question is no, the Court should go no further than to so hold, avoiding "categorical rules that might have wide-ranging and unforeseen impacts" on types of patents not currently before the Court. *Id.* at 3229.

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[3] See, *e.g.*, Kunio Doi, *Current Status and Future Potential of Computer-Aided Diagnosis in Medical Imaging*, 78 Brit. J. of Radiology S3, S3-S19 (2005); Univ. of Ariz. Dep't of Surgery, *Robotic-Assisted Surgery*, http://surgery.arizona.edu/unit/program/robotic-assisted-surgery.

[4] See, *e.g.*, FocusMagic, *Forensics Examples*, http://www.focusmagic.com/forensics-examples.htm; Ocean Systems, *ClearID Examples*, http://www.oceansystems.com/forensic/forensic-Photoshop-Plugins/examples.php.

II. THE PATENTS AT ISSUE IN THIS CASE ARE NOT DIRECTED TO COMPUTER-IMPLEMENTED INVENTIONS AND ARE INELIGIBLE UNDER § 101

This case does not concern a computer-implemented invention. Rather, the patents at issue here are directed to an unpatentable business method combined with an equally abstract directive to perform that method using a computer. Petitioner thus misframes the matter before the Court when it seeks a broad referendum on whether "claims to computer-implemented inventions * * * are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101" (rather than being categorically excluded under the abstract-ideas exception). Pet. Br. i. That begs the antecedent question whether petitioner's business-method-based claims truly are "computer-implemented" inventions. They are not.

An abstract idea is not patentable subject matter under § 101, but an "*application*" of an abstract idea "may well be deserving of patent protection." *Diamond* v. *Diehr*, 450 U.S. 175, 187 (1981); see *Mackay Radio & Tel. Co.* v. *Radio Corp. of Am.*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."). There is a broad spectrum of patents that invoke use of a computer, some of which will be unpatentable "abstract ideas," while others are patentable applications. At one end, as discussed above, are computer-implemented inventions that involve legitimate innovations in computer science, computerized systems, or other technological or industrial fields. Such software innovations are no different than other types of technological inventions that have long been patent eligible under § 101. There should be no doubt that they, too, are patent eligible. See pp. 7-15, *supra*.

At the other end of the spectrum are many so-called "business method" patent claims. Such claims primarily involve processes in non-technological fields, like business or finance. Because such claims are concerned with intangible concepts about organizing human behavior and transactions, they often will implicate the "abstract ideas" exception to § 101. *Bilski*, 130 S. Ct. at 3229-3230. The fact that a business-method claim may also instruct that the concept be implemented using a computer is not itself sufficient "to transform an unpatentable [abstract idea] into a patent-eligible *application* of such [an abstract idea]." *Mayo Collaborative Servs.* v. *Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2011).

Petitioner's patents fall into the latter category. The claims all focus on a method for reducing settlement risk in financial transactions. Some claims may mention computers, but there is no connection between the method described and technological innovation; the references to computers are incidental or pretextual. The putative invention is the method, and that cannot be changed by saying, "and do it on a computer." Far from being directed to patentable computer-implemented inventions, the patents concern unpatentable "abstract ideas" for organizing human obligations. See *Bilski*, 130 S. Ct. at 3225. It is thus not true that, "if all these claims * * * are not patent eligible, this case is the death of * * * all * * * software patents." Pet. App. 85a-86a (Moore, J., dissenting in part). Confirming the invalidity of petitioner's business-method patents would not, under an appropriate standard, imperil the patent eligibility of computer-implemented inventions that represent true technological advances.

A. Adding "a Computer" to the Steps of an Abstract Business Method Does Not Make a Claim Patent Eligible

This case involves so-called "business method" patents. Business-method patents are directed primarily to "methods of organizing human activity." U.S. Br. 8, *Bilski* v. *Kappos*, No. 08-964 (U.S. Sept. 2009) ("U.S. *Bilski* Br."). The purported innovation typically concerns the practice or management of business or financial concepts. While the patent may make token references to using a computer when reciting the steps of the business method, the patent, on its face, is not technological in nature. The mention of a computer is not integral to performing the method, and the claims do not disclose any contribution to computer technology.[5]

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[5] In *Bilski*, the United States urged that claims directed to "technological and industrial processes" should be patent eligible,

Patent claims directed to business methods are different in kind from claims directed to technological or industrial computer-implemented innovations. Indeed, "[f]or centuries, it was considered well established that a series of steps for conducting business was not, in itself, patentable." *Bilski*, 130 S. Ct. at 3232 (Stevens, J., concurring in the judgment). While the Court has declined to hold that § 101 "categorically excludes" such business-method patents, *id.* at 3228 (majority opinion), it has cautioned that they often "raise special problems in terms of vagueness and suspect validity," *id.* at 3229 (plurality opinion); see also *eBay Inc.* v. *MercExchange, L.L.C.*, 547 U.S. 388, 397 (2006) (Kennedy, J., concurring). Chief among those is the concern that such patents may not be patent eligible because they seek to monopolize "abstract ideas" about economic endeavors. See *Bilski*, 130 S. Ct. at 3229-3230.

Where a business-method-based patent would otherwise cover only an "abstract idea," the mere fact that it also recites a computer is not enough to make it a patent-eligible, computer-implemented invention. "[T]o transform an unpatentable [abstract idea] into a patent-eligible *application* of such [an abstract idea], one must do more than simply state the [abstract idea] while adding the words 'apply it.'" *Mayo*, 132 S. Ct. at 1294. Likewise, a claim that recites an abstract business-method idea does not become a patent-eligible application merely by adding the words "do it on a computer"

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but claims directed to "methods of organizing human activity that are untethered to technology" are not. U.S. *Bilski* Br., *supra*, at 8. While the Court did not adopt that as a test for patent eligibility, it is useful for distinguishing computer-implemented inventions from business methods.

(or by adding some similarly token computer-based limitation).

Rather, patent eligibility must turn on whether the use of a computer is integral to the claimed invention itself, or whether the recited use of a computer is merely "insignificant post-solution activity" tacked on to the steps of the business method. *Diehr*, 450 U.S. at 191-192. In *Mayo*, this Court addressed the patent eligibility of claims that "purport to apply natural laws describing the relationships between the concentration in the blood of certain thiopurine metabolites and the likelihood that the drug dosage will be ineffective or induce harmful side effects." 132 S. Ct. at 1294. That correlation itself was an unpatentable law of nature. *Id.* at 1296. The Court held that the other aspects of the claims, such as the process for administering the test, did not "add *enough* to their statements of the correlations to allow the processes they describe to qualify as patent-eligible processes that *apply* natural laws," as opposed to merely seeking to claim the natural law itself. *Id.* at 1297.

Business-method claims likewise will often recite an unpatentable abstract idea. See *Bilski*, 130 S. Ct. at 3229. Generally reciting the use of a computer to implement an otherwise unpatentable method does not "add *enough*" to make it a patent-eligible computer implementation of the idea. *Mayo*, 132 S. Ct. at 1297. Bolting on a requirement that a computer be used in connection with a business method at most "limit[s] the use of the [idea] to a particular technological environment." *Diehr*, 450 U.S. at 191. But that, too, fails to make the abstract method patent eligible. *Id.* at 192.

True computer-implemented inventions—those that are inherently connected to computer technology, enable new functionality, or otherwise produce a technical effect contributing to the utility of the computer—should not run afoul of that prohibition. See pp. 7-15, *supra*. But allowing the token recitation of a computer to establish the patent eligibility of an otherwise unpatentable, non-technological business method would "exalt[ ] form over substance." *Parker* v. *Flook*, 437 U.S. 584, 590 (1978). It is precisely the type of approach this Court has warned "would make the determination of patentable subject matter depend simply on the draftsman's art and would ill serve the principles underlying the prohibition against patents for [abstract] 'ideas' * * * ." *Id.* at 593; see also *Diehr*, 450 U.S. at 192. As explained below, this is such a case: Petitioner's invocation of a computer in its patents is a fig leaf meant to disguise an unpatentable business method as a patent-eligible computer-implemented invention.

B. Petitioner's Purported Invention Is Not Patent-Eligible Subject Matter, But Rather "*Bilski* on a Computer"

1. *Petitioner's Patents Seek To Cover an Abstract Idea*

In *Bilski*, the patent claimed a method for "how buyers and sellers of commodities in the energy market can * * * hedge[ ] against the risk of price changes." 130 S. Ct. at 3223. Claim 1 recited a process involving (1) "initiating a series of transactions" in which "consumers" purchase a "commodity" from a "commodity provider" "at a fixed rate based upon historical averages" that "correspond[ ] to a risk position of said consumers"; (2) "identifying market participants for said commodity having a counter-risk position to said consumers"; and (3) "initiating a series of transactions" between the "commodity provider" and the "market participants at a second fixed rate such that" the "series of market participant transactions balances the risk position of" the first "series of consumer transactions." *Id.* at 3223-3224. Claim 4 "put[ ] the concept articulated in Claim 1" into a "mathematical formula," and other claims described the application of Claims 1 and 4 to energy markets. *Ibid.*

Those claims, the Court explained, sought to cover "the *concept* of hedging risk." 130 S. Ct. at 3229 (emphasis added). The Court held that the claims "fall[ ] outside of § 101," and "are not patentable processes" because they "are attempts to patent abstract ideas." *Id.* at 3229-3230.[6] Upholding petitioners' claims "would effectively grant a monopoly over" the general concept of "risk hedging," and thus "pre-empt use of this approach in all fields." *Id.* at 3231. The fact that certain claims addressed "the application of that concept to energy markets" did not change the outcome. *Id.* at 3229. "[L]imiting an abstract idea to one field of use * * * d[oes] not make the concept patentable." *Id.* at 3231.

This case involves a similar attempt to patent an abstract idea—the concept of an escrow. See Pet. App. 28a (Lourie, J., concurring); *id.* at 82a (Rader, C.J., concurring in part and dissenting in part). For example, claim 33 of petitioner's '479 Patent recites "[a] method of exchanging obligations as between parties, each party holding a credit record and a debit record with an exchange institution, the credit records and debit records for exchange of predetermined obligations." Pet. App. 26a. It breaks the method into four steps: (1) a third-party "supervisory institution" creates "shadow" records for each stakeholder that reflect the parties' balances in real financial accounts at "exchange institutions"; (2) the supervisory institution obtains a "start-of-day-balance" from the parties' exchange institutions for use in their shadow records; (3) transactions are referred to the supervisory institution, which "adjust[s] each respective party's shadow" records and "permit[s] only those transactions" for which updated records indicate there are sufficient funds; and (4) "at the end-of-day," the supervisory institution instructs the respective exchange institutions to "irrevocabl[y]" "exchange credits or debits" in the parties' financial accounts. *Id.* at 26a-27a.

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[6] Four Justices would have held that the claims were not patent eligible "because methods of doing business are not, in themselves, covered by the statute." *Bilski*, 130 S. Ct. at 3257 (Stevens, J., concurring in the judgment).

For purposes of § 101 patent eligibility, that method claim is "indistinguishable from the claim in *Bilski*." Pet. App. 84a (Rader, C.J., concurring in part and dissenting in part); *id.* at 31a (Lourie, J., concurring) (claims "closely resemble those in *Bilski*"). Like the claim in *Bilski*, it covers a "fundamental economic practice" for "protecting against risk," *Bilski*, 130 S. Ct. at 3231—the use of an intermediary to "mitigate 'settlement risk.'" Pet. App. 26a (Lourie, J., concurring). While the claim breaks the process down into steps (again like *Bilski*), those steps simply "explain the basic concept" of an escrow. *Bilski*, 130 S. Ct. at 3231. The claim invokes "extravagant" *sounding* terms (like "shadow records"), Pet. App. 30a (Lourie, J., concurring), but upon analysis, each step is itself "inherent within the concept of an escrow," *id.* at 83a (Rader, C.J., concurring in part and dissenting in part). The Federal Circuit thus had no difficulty concluding, by a 7-3 vote, that the method claim here, like the claim in *Bilski*, seeks to cover an unpatentable "abstract idea"—the idea of an escrow itself—as opposed to a particular application of that idea. See Pet. App. 3a n.1 (Lourie, J., concurring).

2. *Recitation of a Computer Does Not Make the Claims Patent Eligible*

The patents at issue here also *purport* to cover "computer-based" implementations of an escrow. Petitioner's supposedly computer-based claims, however, stand in stark contrast with the software-based innovations described above (at pp. 7-15). The claims at issue here do nothing to advance the state of technology. They do not describe a new computer, enable general-purpose computers to perform new functions related to escrows, or allow computers to execute the steps of an escrow transaction faster, more efficiently, or more reliably than before. Petitioner's own description of its "computer systems, computerized methods, and computer products" claims makes clear that they are not directed to technological innovation, but to steps "to eliminate * * * settlement risk." Pet. Br. 4; see also *id.* at 7, 8-9, 10. In substance, the claims have nothing to do with computers beyond saying that one could use a computer to perform an escrow. The abstract business-method claims in *Bilski* would not have become patent eligible had the inventor simply added "perform the steps of hedging on a computer." This case should be no different.

Petitioner's method claims make that particularly clear. They simply recite the steps inherent in executing an escrow transaction—they do not even mention a computer. See pp. 23-24, *supra*. While the parties stipulated that the steps should "be interpreted to require a computer," Pet. App. 6a (Lourie, J., concurring), the claim does not describe a series of computer operations. It is thus impossible to construe the operation of a computer as being integral to executing the steps of the method, much less to read the claim as encompassing an advance in software or any computer-related field. As a result, the parties' stipulation that a computer should be used at most stipulates to some "insignificant post-solution activity." *Diehr*, 450 U.S. at 191-192. The stipulation may "limit the use of the [idea] to a particular technological environment," but that cannot make the method patent eligible. *Id.* at 191.

Petitioner's "computer readable medium" and "system" claims fare no better. Both purport to describe tangible things—respectively, a "computer program product comprising a computer readable storage medium," Pet. App. 32a, and a "data processing system" comprised of "a data storage unit" "coupled to" "a computer," *id.* at 35a. But neither set of claims describes a technological innovation in the recited hardware or the software that makes it run. Indeed, the claims have nothing to do with advances in or new applications of computing technology to execute escrow transactions. Instead, the claims simply recite the same steps of the business method recited in the method claim, while sprinkling in references to generic computer hardware. See *id.* at 32a, 35a. Merely mentioning a computer in connection with the method steps does not "add *enough*" to the description of the abstract business method to limit claims to a specific, practical application that is narrower than the idea itself. *Mayo*, 132 S. Ct. at 1297. Simply adding "program code for causing a computer" to execute an escrow transaction, Pet. App. 32a, or generically "configur[ing]" a "computer" to execute an escrow, *id.* at 35a, "add[s] nothing of significance" to the basic idea of an escrow, *Mayo*, 132 S. Ct. at 1302.

Through the "draftsman's art," *Flook*, 437 U.S. at 593, petitioner's computer-readable-medium and system claims purport to describe tangible, technological devices. But one should not "exalt[ ] form over substance."

Id. at 590. The computer references are incidental or pretextual—they amount to nothing more than saying, "one could perform the steps of an escrow using a computer." That is not enough "to transform an unpatentable [abstract idea] into a patent-eligible *application* of [that idea]." *Mayo*, 132 S. Ct. at 1294. To resolve this case, the Court need go no further.

III. IN HARDER CASES, PATENT ELIGIBILITY SHOULD TURN ON WHETHER THE CLAIM AS A WHOLE RECITES A SPECIFIC, PRACTICAL APPLICATION OF THE IDEA RATHER THAN MERELY RECITING STEPS INHERENT IN THE IDEA ITSELF

Far from describing a technological innovation in computing technology, the patents at issue disclose an abstract idea and add to it only a bald directive to implement it on a computer. Because § 101 serves as "a 'coarse' gauge of the suitability of broad subject matter categories for patent protection," *Ultramercial, Inc.* v. *Hulu, LLC*, 722 F.3d 1335, 1339 (Fed. Cir. 2013), § 101's "threshold test," *Bilski*, 130 S. Ct. at 3225, is well-suited to the evaluation of such unpatentable business methods. Given their non-technical nature, the substance and preemptive scope of such patents often will be readily apparent to a non-expert district court judge on the face of the claim language. See *id.* at 3231. Efforts to use the "draftsman's art," *Flook*, 437 U.S. at 593, to dress up an abstract business-method claim as something it is not will generally be transparent.

When it comes to true computer-implemented inventions, however, a blunt or simplistic application of the "abstract ideas" exception poses grave risks. Software is heavily dependent upon the use of algorithms. And it is "clear that a process is not unpatentable simply because it contains a * * * mathematical algorithm." *Flook*, 437

U.S. at 590. Where a software patent describes a practical application of an algorithm as part of a process that produces a technological effect or useful result on a computer—*e.g.*, encryption, data compression, higher-speed processing—that should be patent eligible under this Court's precedent. See *Diehr*, 450 U.S. at 187-188. By contrast, where a patent claims use of an algorithm merely to produce "a number," but does not utilize that calculation in service of a specific technological application, that may not be patent eligible under existing precedent, even where used on a computer. *Flook*, 437 U.S. at 585. Regrettably, it may be very difficult for a lay judge, with little technical understanding of how computers actually operate, to discern the difference between the two. In such cases, expert testimony may be necessary to illuminate the technological principles at issue, and claim construction required to determine the precise boundaries (and actual preemptive scope) of the patent. Even then, it still may be difficult to determine whether the patent covers an "abstract idea" or not.

Precisely because that difficulty is not present here, the Court should avoid "adopting categorical rules" and broad pronouncements regarding § 101 patent eligibility "that might have wide-ranging and unforeseen impacts"—indeed, the potential to destabilize multiple industries. *Bilski*, 130 S. Ct. at 3229. To the extent lower courts require guidance for determining the patent eligibility of software claims—as opposed to business-method claims masquerading as software—the Court should await a case with a "fully developed factual and legal record" reflecting the issues. *Adams* v. *Robertson*, 520 U.S. 83, 92 (1997) (per curiam).

In the meantime, courts can continue to address the patent eligibility of computer-implemented inventions using principles articulated in this Court's prior § 101 decisions. Those principles require courts to focus on the patent claims themselves, taken as a whole. And they make clear that a claim invoking an abstract concept will be patent eligible only if it also contains sufficient limitations to restrict the invention to a specific, practical application of the idea, rather than covering the idea itself. Those principles may prove difficult to apply in some circumstances, but by retaining a claim-specific approach, they help ensure that § 101 remains flexible enough "to encompass new and unforeseen inventions." *J.E.M. Ag Supply, Inc.* v. *Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135 (2001).

A. Patent Eligibility Can Be Determined Only by Looking to Each Claim, Taken as a Whole

The Court has made clear that, in determining whether a patent seeks to cover an unpatentable abstract idea or a patent-eligible application of the idea, courts must look to what is actually claimed. The primary concern animating the abstract-idea exception is the "danger" that patents that "tie up" an abstract idea's use "will inhibit future innovation premised upon" that idea, and thus "foreclose[ ] more future innovation than the underlying discovery could reasonably justify." *Mayo*, 132 S. Ct. at 1301. And one can determine how much of an idea the patent "ties up" only by looking to the claims themselves, because it is the claims that "define[ ] the scope of a patent grant." *Markman* v. *Westview Instruments, Inc.*, 517 U.S. 370, 373 (1996) (quotation marks omitted). If a claim recites additional limitations drawn to a sufficiently specific, practical means of applying the underlying abstract idea, it will ensure that the patent does not foreclose others from developing or practicing different implementations of the idea.

All of the claim's elements thus must be "considered as a whole." *Diehr*, 450 U.S. at 188. In *Mayo*, the Court described the process as looking to the "inventive concept" in the claim. 132 S. Ct. at 1294. That does not suggest that courts should isolate what they perceive to be the "heart" or "gist" of the claim and ask whether *that* is an abstract idea. Rather, it means the court should consider the *entire* "combination of elements" recited in the claim in order "to ensure that the patent in practice amounts to significantly more than the [abstract idea] itself." *Ibid.* Indeed, the Court has held that "[i]t is inappropriate to dissect the claims" by isolating the core concept from the limitations that purport to implement that concept. *Diehr*, 450 U.S. at 188; see also *Bilski*, 130 S. Ct. at 3230. Where a court focuses its analysis on the underlying concept divorced from the context of the claim, it improperly skews the analysis, because "all inventions at some level embody, use, reflect, rest upon or apply laws of nature, natural phenomena, or abstract ideas." *Mayo*, 132 S. Ct. at 1293. It likewise runs the risk of trivializing the other limitations and improperly dismissing them as "insignificant post-solution activity." *Diehr*, 450 U.S. at 191-192.

B. This Court's Precedents Guide the Distinction Between Unpatentable Abstract Ideas and Patent-Eligible Applications

This Court has explained that, in distinguishing between an unpatentable abstract idea and a patent-eligible application of that idea, courts must ask whether the limitations in "the patent claims," taken as a whole, "add *enough*" in the way of specific, practical application to differentiate the scope of the claimed invention from the underlying abstract idea itself. *Mayo*, 132 S. Ct. at

1297. This Court's precedents provide several helpful guideposts in drawing that distinction.

O'Reilly v. *Morse*, 56 U.S. (15 How.) 62 (1853), which concerned a patent by Samuel Morse, is particularly instructive because it involved some claims that were patent eligible and others that were not. Claim 8 of Morse's patent purported to cover "the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed for marking or printing intelligible characters, signs, or letters, at any distances." *Id.* at 112-13. That claim, the Court found, recited the *idea* of using electric current for printing characters at a distance, but it did not describe any specific "process or machinery [by which] the result is accomplished"—put differently, the claim recited the idea, but no practical *application* of the idea. *Id.* at 113. As a result, the claim sought "a monopoly in [the idea's] use, however developed," thus "claim[ing] an exclusive right to use * * * manner[s] and process[es] which [Morse] has not described and indeed had not invented." *Ibid.* Allowing a patent over the idea itself, the Court noted, would "shut[ ] the door" to "every new discovery and development of the science," no matter what form it took. *Ibid.* Accordingly, "the claim [was] too broad" and not patentable subject matter. *Ibid.*

By contrast, the Court did allow other claims that recited specific, practical applications of the principle Morse had articulated. For example, Claim 3 described in detail a device for using galvanic current to print at distances, which was comprised of "the combination of machinery herein described, consisting of the generation of electricity, the circuit of conductors, the contrivance for closing and breaking the circuit, the electro-magnet, the pen or contrivance for marking, and the machinery for sustaining and moving the paper." *Morse*, 56 U.S. (15 How.) at 85. And Claim 5 dealt not with machinery, but with the use of Morse code—*i.e.*, "the system of signs, consisting of dots and spaces, and of dots, spaces, and horizontal lines, for numerals, letters, words, or sentences," as described in the patent—"for telegraphic purposes." *Id.* at 86. For those specific, practical applications of Morse's discovery, Morse was "entitled to a patent." *Id.* at 117.

The Court's decisions in *Parker* v. *Flook*, 437 U.S. 584 (1978), and *Diamond* v. *Diehr*, 450 U.S. 175 (1981), are, together, similarly helpful guideposts, because they are "two cases in which the Court reached opposite conclusions about the patent eligibility of processes that embodied the equivalent of natural laws." *Mayo*, 132 S. Ct. at 1298. *Flook* concerned a method claim for "updating the value" of an "alarm limit" on a "process variable"—*e.g.*, temperature, pressure, flow rates—"involved in a process comprising the catalytic chemical conversion of hydrocarbons." 437 U.S. at 596. Specifically, the recited steps involved (1) "[d]etermining the present value" of the relevant "process variable"; (2) "[d]etermining a new alarm base" using a specified mathematical formula; (3) "[d]etermining an updated alarm limit"; and (4) "[a]djusting said alarm limit to said updated alarm limit value." *Id.* at 597. The Court held that the claim was not patent eligible because it sought to cover an abstract idea—the mathematical formula utilized in the claim—rather than a sufficiently particularized application of that idea. While the claim nominally purported to cover *use* of the equation in connection with a catalytic converter, it did not recite a sufficiently specific method for *how* to do so. The claim did not, for example, "explain how to select the appropriate margin of safety, the weighting factor, or any of the variables. Nor d[id] it purport to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system." *Id.* at 586. To the contrary, "all that it provide[d] is a formula for computing an updated alarm limit," *ibid.*, which is itself simply "a number," *id.* at 585. Thus, the Court held, the "other steps in the process did not limit the claim to a particular application" of the unpatentable mathematical formula. *Mayo*, 132 S. Ct. at 1299 (discussing *Flook*).

The claim at issue in *Diehr* was for a "method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer." 450 U.S. at 179 n.5. Like *Flook*, the claim involved use of a mathematical formula, the "Arrhenius equation." *Ibid.* The claim recited the following steps: (1) "providing said computer with a data base for said press including at least, natural logarithm conversion data (ln), the activation energy constant (C) unique to each batch of said compound being molded, and a constant (x) dependent upon the geometry of the particular mold in the press"; (2) "initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure"; (3) "constantly determining the temperature (Z)"; (4) "repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is $\ln v = CZ + x$ where v is the total required cure time"; (5) "repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time"; and (6) "opening the press automatically when a said comparison indicates equivalence." *Ibid.*

Contrasting the claim at issue with that in *Flook*, the Court found that it did "not seek to patent a mathematical formula" or "pre-empt the use of [the Arrhenius] equation." *Diehr*, 450 U.S. at 187. Rather, it sought "patent protection for a process of curing synthetic rubber," *ibid.*, and the "claims describe in detail a step-by-step method for accomplishing such" a process, *id.* at 184. The Court held that "Arrhenius' equation is not patentable in isolation, but when a process for curing rubber is devised which incorporates in it a more efficient solution of the equation, that process is at the very least not barred at the threshold by §101." *Id.* at 188. "Industrial processes such as this are the types which have historically been eligible to receive the protection of our patent laws." *Id.* at 184.

The different outcomes in *Flook* and *Diehr* thus boiled down to whether the claims recited a practical application of the abstract concept with sufficient specificity. If the claim in *Flook* had not merely recited the mathematical equation for adjusting an alarm limit—which yielded only "a number," 437 U.S. at 585—but instead also recited specific steps for a practical application of the equation in connection with catalytic conversion, the Court may well have found the claim patent eligible. Conversely, if the claim in *Diehr* had generically recited the concept of using the Arrhenius equation to determine how long to let rubber cure in a mold, without detailing the specific steps of *how* to effectuate that through a particular process, that claim may have been found ineligible.

Morse, *Flook*, and *Diehr* thus provide courts with guidance in deciding the patent eligibility of computer-implemented processes. By focusing on whether the claims recite a sufficiently specific application of any abstract ideas on which they depend, courts can ensure that the patentee's right to exclude "is commensurate with the invention's practical, real-world contribution, rather than asserting coverage over general ideas unmoored to a specific application." Mark A. Lemley *et al.*, *Life After* Bilski, 63 Stan. L. Rev. 1315, 1317 (2011). There may be harder cases that involve how to apply those principles. But this case is not one of them.

CONCLUSION

The judgment of the Federal Circuit should be affirmed.

Respectfully submitted.

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AMICUS
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BRIEF

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Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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QUESTION PRESENTED

Whether claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

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INTEREST OF *AMICUS CURIAE*

The New York Intellectual Property Law Association ("NYIPLA" or "Association") respectfully submits this *amicus curiae* brief in support of neither party.[1]

The arguments set forth herein were approved on January 21, 2014 by an absolute majority of the officers and members of the Board of Directors of the NYIPLA, including any officers or directors who did not vote for any reason, including recusal, but do not necessarily reflect the views of a majority of the members of the Association, or of the law or corporate firms with which those members are associated. After reasonable investigation, the NYIPLA believes that no officer or director or member of the Committee on *Amicus* Briefs who voted in favor of filing this brief, nor any attorney associated with any such officer, director or committee member in any law or corporate firm, represents a party in this litigation. Some officers, directors, committee members or associated attorneys may represent entities, including other *amici curiae*, which have an interest in other matters which may be affected by the outcome of this litigation.

The NYIPLA is a professional association of approximately 1,300 attorneys whose interests and practices lie in the area of patent, trademark, copyright, trade secret and other intellectual property law. The Association's members include a diverse array of attorneys specializing in patent law, from in-house counsel for businesses that own, enforce and challenge patents to attorneys in private practice who represent inventors in various proceedings before the United States Patent and Trademark Office ("PTO").

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[1] Petitioner and Respondents consented to the filing of *amicus curiae* briefs in support of either party or neither party in separate docket entries dated December 11, 2013. Pursuant to Sup. Ct. R. 37.6, no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than the NYIPLA, its members, or its counsel made a monetary contribution to its preparation or submission.

A substantial percentage of the Association's member attorneys participate actively in patent litigation, representing both patent owners and accused infringers. The NYIPLA's members also frequently engage in patent licensing matters on their clients' behalf, representing both patent licensors and licensees.

The entities served by the Association's members include inventors, entrepreneurs, venture capitalists, businesses, universities, and industry and trade associations. Many of these entities are involved in research, patenting, financing and other commercial activity relating to the financial industry and other software-dependent fields.

The NYIPLA's members and their respective clients have a strong interest in the issues presented by this case because their day-to-day activities depend on the consistently-applied and longstanding broad scope of patent-eligible subject matter under the Patent Act in general. Because of the vital and increasing importance of computer-implemented technology to the economy, moreover, the NYIPLA and its members have a particularly strong interest in ensuring that their reasonable expectation that those principles continue to be consistently applied in those important areas.

SUMMARY OF ARGUMENT

Without offering any opinion on the validity of the claims at issue, the NYIPLA respectfully submits this brief to provide its views on how the Court should answer the question presented to clarify the lower courts' application of this Court's precedent under 35 U.S.C. § 101, as set forth in *Bilski v. Kappos*, 130 S. Ct. 3218, 3229, 3231 (2010), and *Diamond v. Diehr*, 450 U.S. 175, 188-89 (1981).

Recent patent-eligibility jurisprudence has not yet dispelled many of the doubts surrounding patents covering computer-implemented inventions. The NYIPLA encourages the Court to clarify that claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—may indeed be directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101. This Court has previously espoused fair, reasonable and predictably applied principles that allow appropriate inventions to be the subject of patent protection. The NYIPLA believes that any confusion regarding the patent-eligibility of computer-implemented inventions under 35 U.S.C. § 101 may be laid to rest by applying the guiding principles set forth herein, which have been extracted from this Court's patent-eligibility jurisprudence. *See infra* Part I.

This Court has consistently framed the patent-eligibility analysis under 35 U.S.C. § 101 as a two-part inquiry involving the following questions:

1. Does the claimed subject matter fall within one of the four statutory categories of patent-eligible subject matter: (i) process, (ii) machine, (iii)

manufacture, or (iv) composition of matter (or any improvement thereof)?

2. If so, is the claimed subject matter directed to one of the three "fundamental principles"—laws of nature, natural phenomena, or abstract ideas—that are exceptions to patent-eligible subject matter?

See, e.g., *Bilski*, 130 S. Ct. at 3225.

The first question is a relatively straightforward inquiry: is the claim directed to at least one of the four statutory forms of patent-eligible subject matter? For the most part, the courts have applied this first question as a relatively low hurdle, and should not now introduce any extra-statutory limitations. *See infra* Part I.

However, as illustrated by the opinions of the lower courts in this case, there has been much debate among the trial courts and at the Federal Circuit on the proper analysis to use when answering the second question. It has proven exceptionally difficult to reach a consensus on the proper method of determining whether "abstract ideas" are claimed in the area of computer-implemented inventions. Although the Federal Circuit sought to resolve this issue in an *en banc* rehearing, the resulting opinions were too divided to provide the necessary guidance on this important issue. The NYIPLA respectfully proposes, consistent with this Court's decisions in, *e.g.*, *Diehr* and *Bilski*, that the focus of any Section 101 inquiry must be on the difference between claims that preempt an abstract idea, which are patent-ineligible, and claims that are directed to a particular application of an abstract idea, which are patent-eligible. *See infra* Part I.

Under this Court's governing precedent, the mere presence of a computer in a claim should not alter the fundamental analysis as to whether the claim as a whole preempts the abstract idea at issue or whether there remain available ways outside of the claim to apply the abstract idea. *See infra* Part II.A. Moreover, this inquiry must address the claim as a whole. Efforts in some lower court decisions to dissect the claim into old and new parts or computer and non-computer elements, should be rejected as squarely inconsistent with this Court's holdings in *Diehr* and *Bilski*.

Unfortunately, much of the recent confusion of this point can be traced to the ways that some lower courts have misconstrued *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1297 (2012). The NYIPLA respectfully suggests that the Court's language in *Mayo*—including "the steps in the claimed processes . . . involve well-understood, routine, conventional activity previously engaged in by researchers in the field," and "those steps, when viewed as a whole, add nothing significant beyond the sum of their parts taken separately," *id.* at 1294, 1298—has led some lower courts to ignore the fundamental principle laid out in *Diehr*, 450 U.S. at 187-88, that patent claims must be analyzed as a whole and not be dissected and analyzed piecemeal. Accordingly, the NYIPLA respectfully requests that the Court readdress this language and reaffirm the principles set forth in *Diehr* and *Bilski*.

In addition, while the presence of a computer in a claim that preempts an abstract idea should not in and of itself be sufficient to establish patent-eligible matter, it is not insignificant to the analysis. For example, in the context of the "mental steps" doctrine, the use of a machine, *i.e.*, a computer or hardware, to participate meaningfully in the claimed actions can overcome these categories of objections to patent-eligibility. *See infra* Part II.B.

Finally, the NYIPLA respectfully submits that whether a computer-implemented invention is claimed as a method, system or storage medium should not affect the Section 101 analysis. *See infra* Part III. A proper analysis should not depend upon the form of the claims. This would elevate form over substance. Nevertheless method, system and storage medium claims should not *ipso facto* rise and fall together. Rather, each claim (regardless of its type) should be considered independently as a whole to determine whether it is directed to patent-eligible subject matter.

ARGUMENT

I. GUIDING PRINCIPLES OF PATENT-ELIGIBILITY DERIVED FROM GOVERNING SUPREME COURT PRECEDENT

The statutory language of 35 U.S.C. § 101 clearly defines patent-eligible subject matter:

> Whoever invents or discovers any new or useful process, machine, manufacture or composition of matter, or any new or useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101. Decades of this Court's detailed interpretation confirm Section 101's breadth. Recently,

in *Bilski v. Kappos*, the Court once again "decline[d] to impose limitations on the Patent Act that are inconsistent with the Act's text," 130 S. Ct. at 3231, and reconfirmed the wide scope for patentability of inventions under Section 101. *Id.* at 3225; *see J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 130 (2001) ("As this Court recognized over 20 years ago in *Chakrabarty*, the language of § 101 is extremely broad.") (citation omitted); *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980).

The Association respectfully submits that nothing about the case at bar compels any reevaluation of the straightforward rules for assessing patent eligibility. These rules, when applied as discussed below, should enable inventors, practitioners and the public alike to determine with reasonable certainty whether computer-implemented inventions are patentable under Section 101.

Since *Diehr*, the Court has consistently based the patent-eligibility investigation on two inquiries:

1. Does the claimed subject matter fall within one of the four statutory categories of patent-eligible subject matter: (i) process, (ii) machine, (iii) manufacture, or (iv) composition of matter (or any improvement thereof)?

2. If so, is the claimed subject matter directed to one of three so-called "fundamental principles," *i.e.*, laws of nature, natural phenomena or abstract ideas, which are exceptions to patent-eligible subject matter?

See Bilski, 130 S. Ct. at 3225; *Diehr*, 450 U.S. at 185 (harmonizing, *inter alia*, *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980); *Parker v. Flook*, 437 U.S. 584, 589 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)).

Under the first inquiry, for an invention to be patent-eligible, it must fall within at least one of the four enumerated categories of patent-eligible subject matter, namely: "process," "machine," "manufacture" or "composition of matter." 35 U.S.C. § 101. This should be a straightforward analysis and should not include narrow definitions. For example, in *Bilski*, the Court refused to adopt a new rule categorically excluding patent-eligible subject matter from the term "process." *Bilski*, 130 S. Ct. at 3227 ("Section 101 is a 'dynamic provision designed to encompass new and unforeseen inventions.'") (quoting *J.E.M. Ag Supply*, 534 U.S. at 135; *Charkrabarty*, 447 U.S. at 308 (cautioning that "courts should not read into the patent laws limitations and conditions which the legislature has not expressed") (internal quotation and citation omitted)).

The second inquiry asks whether the invention falls into what this Court has historically recognized as the three exceptions to this general rule: it must not claim (*i.e.*, preempt) "laws of nature, natural phenomena, [or] abstract ideas." *Mayo*, 132 S. Ct. at 1293 (quoting *Diehr*, 450 U.S. at 185); *Bilski*, 130 S. Ct. at 3225; *Chakrabarty*, 447 U.S. at 309. This Court has reasoned that these fundamental principles "are not patentable, as they are the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67. "Thus, a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that

$E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are 'manifestations of . . . nature, free to all men and reserved exclusively to none.'" *Chakrabarty*, 447 U.S. at 309 (citation omitted).

With respect to this second inquiry, however, as discussed in *Diehr, Bilski* and *Mayo*, ample, and in some cases ancient, precedent has recognized that an invention may nonetheless be directed to the ***practical application*** of a fundamental principle and be patent-eligible. *See Mayo*, 132 S. Ct. at 1293-94 ("[A]n ***application*** of a law of nature or a mathematical formula to a known structure or process may well be deserving of patent protection.") (quoting *Diehr*, 450 U.S. at 187); *Bilski*, 130 S. Ct. at 3230 (same); *Cochrane v. Deener*, 94 U.S. 780 (1877); *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854); *Le Roy v. Tatham*, 55 U.S. (14 How.) 156 (1853). Thus, under the second inquiry, a determination must be made as to which side of the line the claimed subject matter falls: a fundamental principle, which is not patent-eligible, or a practical application of a fundamental principle, which is patent-eligible.

The focus in this case is on the "abstract idea" exception. Both this Court and the Federal Circuit have recognized that categories of unpatentable abstract natural principles at times may be difficult to define. Indeed, no clear definition of "abstract" has emerged. *Flook*, 437 U.S. at 589 ("The line between a patentable 'process' and an unpatentable 'principle' is not always clear."); *see also Bilski*, 130 S. Ct. at 3236 (noting the absence of a "satisfying account of what constitutes an unpatentable abstract idea") (Stevens, J., concurring); *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 868 (Fed. Cir. 2010) ("[T]his court also will not presume to define 'abstract' beyond the recognition that this disqualifying characteristic should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act.").

Nevertheless, this Court has confirmed the following guidelines to determine whether a claim is directed to a patent-ineligible fundamental principle or to the patent-eligible practical application of a fundamental principle:

1. Merely restricting an abstract idea to a particular field of use, like energy markets in *Bilski*, does not convert an abstract principle into a practical application of an abstract principle. *Bilski*, 130 S. Ct. at 3225; *see also Mayo*, 132 S. Ct. at 1294; *Diehr*, 450 U.S. at 191-92.

2. Merely tying a claim to a machine or computer in an extra-solutional manner is also not sufficient to transform an abstract principle into a patent-eligible practical application of that principle. *See Mayo*, 132 S. Ct. at 1294; *Bilski*, 130 S. Ct. at 3230; *Diehr*, 450 U.S. at 191-92; *Flook*, 437 U.S. at 590, 594.

3. As stated in *Bilski*, the so-called machine-or-transformation test, while useful, is not dispositive, and, as suggested by the patent-ineligible result in *Mayo*, satisfying the transformation prong is not necessarily a safe harbor. *Mayo*, 132 S. Ct. at 1302-03; *Bilski*, 130 S. Ct. at 3225-27.

4. A claim must do something more than merely "apply" a fundamental principle to transform it into a practical application thereof. *Mayo*, 132 S. Ct. at 1294; *Benson*, 409 U.S. at 71-72.

Although this Court in *Bilski* left it to the Federal Circuit to develop, based on this foundation, the contours of the distinction between preempting an abstract idea and practically applying one, 130 S. Ct. at 3229, the Federal Circuit has been unable to do so. *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1292 n.1 (Fed. Cir. 2013) (Rader, J., dissenting-in-part) ("No portion of any opinion issued today other than our Per Curiam Judgment garners a majority. . . . Accordingly, though much is published today discussing the proper approach to the patent eligibility inquiry, nothing said today beyond our judgment has the weight of precedent."). Instead, Section 101 analysis and judicial analysis of "abstract ideas" has become muddled.[2]

For example, inconsistent with this Court's directive in *Diehr* to analyze the claim as a whole, some Federal Circuit panels have appeared to dissect claims into their various elements and analyze the elements considered to be "inventive" divorced from the remaining elements of the claim. *See, e.g., Bancorp Servs., LLC v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1279 (Fed. Cir. 2012), *petition for cert. filed* (U.S. Nov. 8, 2013) (No. 13-584) (setting aside purportedly "insignificant computer-based limitations" and then analyzing the additional features that remain in the claims ignoring the computer aspects); *Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1374 (Fed. Cir. 2011) (explaining that the patent-eligibility analysis must "look to the *underlying invention* for patent-eligibility purposes" rather than limit the analysis to the statutory category—"process, machine, manufacture, or composition of matter"—of the claim language) (emphasis added).

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[2] *See generally* Charles R. Macedo & Sandra A. Hudak, *Understanding Patent Eligibility of New Technology in the United States*, 7 J. Intell. Prop. L. & Prac. 865-71 (2012).

These departures from precedent may be attributed to language in *Mayo* that suggests that a requirement for patent-eligibility is that a claim "ha[ve] additional features that provide practical assurance that the [claim] is more than a drafting effort designed to monopolize the [fundamental principle] itself." *Mayo*, 132 S. Ct. at 1297; *see Bancorp*, 687 F.3d at 1279 (interpreting *Mayo*'s statement—"What else is there in the claims before us?"—as setting aside the fundamental principle in the claim at issue rather than analyzing the elements of the claim as a whole). Yet *Mayo* did not disavow or overrule *Diehr*.

Diehr set forth three cardinal rules that must be followed when assessing whether a claimed process crosses the threshold from a patent-ineligible, abstract natural principle to the concrete human-made realm of patent-eligible subject matter:

1. The claim "must be considered as a whole." *Diehr*, 450 U.S. at 188; *see Bilski*, 130 S. Ct. at 3230; *Flook*, 437 U.S. at 590 ("[A] process is not unpatentable because it contains a law of nature or a mathematical algorithm.").

2. "It is inappropriate to dissect the claims into old and new elements and then to ignore the presence

of the old elements in the analysis." *Diehr*, 450 U.S. at 188; *see Bilski*, 130 S. Ct. at 3230.

3. "The 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Diehr*, 450 U.S. at 188-89; *see id.* at 193 n.15 ("The fact that one or more of the steps in respondents' process may not, in isolation, be novel or independently eligible for patent protection is irrelevant to the question of whether the claims as a whole recite subject matter ***eligible*** for patent protection under § 101.") (emphasis in original).

Considering the claim as a whole respects the overall patentability framework, as claims "particularly point[] out and distinctly claim[] the subject matter which the [applicant] regards as his invention." 35 U.S.C. § 112. For processes, an inventor's characterization of the invention is critical because "a new combination of steps in a process may be patentable even though all the constituents in the combination were well known and in common use before the combination was made." *Diehr*, 450 U.S. at 188.

The recent decisions misconstruing *Mayo* and overlooking *Diehr* harm the U.S. economy and the patent system as a whole insofar as they mistakenly deny patent protection to computer-implemented inventions that would have been held patent-eligible had a proper 35 U.S.C. § 101 analysis been conducted. As Judge Moore explained in her dissent below, failing to "evaluate each claim as a whole when analyzing validity" and substituting the reasoning of

Judge Lourie's concurring opinion could "render ineligible nearly 20% of all the patents that actually issued in 2011" and "decimate the electronics and software industries." *CLS Bank Int'l*, 717 F.3d at 1313 (Moore, J., dissenting-in-part).

The importance of computer-implemented inventions to the U.S. economy extends far beyond the importance of the American computer industry *per se*. As the Economics and Statistics Administration and the PTO reported in March 2012, computers and peripheral equipment are part of the top patent-intensive job-producing sector in the U.S. economy. Econ. & Statistics Admin. and PTO, *Intellectual Property and the U.S. Economy: Industries in Focus* (Mar. 2012), www.uspto.gov/news/publications/IP_Report_March_2012.pdf. Moreover, computer-implemented inventions are critical to the productivity of all sectors of the U.S. economy.[3] Computers power our modern service economy as surely as steam and then internal combustion engines powered the manufacturing sector that drove our economic prosperity in the nineteenth and twentieth centuries.

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[3] Indeed, as former Director Kappos explained: "Because many breathtaking software-implemented innovations power our modern world, at levels of efficiency and performance unthinkable even just a few years ago, patent protection is every bit as well-deserved for software-implemented innovation as for the innovations that enabled man to fly, and before that for the innovations that enabled man to light the dark with electricity, and before that for the innovations that enabled the industrial revolution." *See* David Kappos, PTO Dir., An Examination of Software Patents, Address at Center for Am. Progress (Nov. 20, 2012), *available at* www.uspto.gov/news/speeches/2012/kappos_CAP.jsp.

Accordingly, the NYIPLA believes this Court should confirm its historical commitment to a clear and consistent jurisprudence that allows for and encourages computer-implemented inventions that promote innovation and creativity. Following these principles, the NYIPLA addresses the question presented as follows.

II. TEST FOR ABSTRACTNESS OF COMPUTER-IMPLEMENTED INVENTIONS

As discussed above, after ascertaining that the claimed subject matter falls within one of the four statutory categories of patent-eligible subject matter, a proper Section 101 analysis should next consider whether the claimed subject matter is directed towards a fundamental principle: laws of nature, natural phenomena or abstract ideas.

The NYIPLA respectfully submits that in order to determine whether a claim is directed to a patent-ineligible abstract idea rather than a patent-eligible application of an abstract idea, the Court should confirm its commitment to an approach in which the "abstract idea" implicated is first defined, and next, the claim as a whole is analyzed to determine if there are ways to practice this "abstract idea" that fall outside the scope of the claimed invention. Under this approach, the presence or absence of a computer or machine in a claim is not dispositive. This approach is consistent with the methodology applied in *Bilski* and *Diehr*. *See infra* Part II.A.

However, including a computer in a claim may make a difference in addressing categories of patent-eligibility objections that are based on other doctrines, like the "mental steps" doctrine. *See infra* Part II.B. Understanding the role of these doctrines also helps to explain the evolution of the so-called "machine-or-transformation test" and to understand the circumstances in which it is appropriately applied.

A. Proposed Test for Determining Whether Claims Preempt an Abstract Idea

The NYIPLA respectfully submits that, consistent with this Court's precedent, a line should be drawn in favor of patent-eligibility of a claim that involves the practical application of an abstract idea, where a computer-implemented application of the idea is but one of multiple ways to practice the idea. To make this determination, first the "abstract idea" implicated must be defined, and then the claim as a whole must be analyzed to determine if there are ways to practice this "abstract idea" that fall outside the scope of the claimed invention.

Bilski and *Diehr* illustrate this approach. In *Bilski*, the abstract idea was "hedging risk." *Bilski*, 130 S. Ct. at 3222-24. The *Bilski* claim was found to preempt anyone from practicing the abstract idea, albeit within a particular field of use, *i.e.*, energy markets. *Id.* at 3231. By contrast, in *Diehr*, the abstract idea was a particular mathematical formula. 450 U.S. at 177. However, the claim did not preempt all uses of that mathematical formula, even in the context of the field of use of curing rubber. Rather, it was limited to a particular application of that formula based on specific limiting steps:

> [R]espondents here do not seek to patent a mathematical formula. Instead, they seek

> patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation ***in conjunction with all of the other steps in their claimed process.***

Id. at 187 (emphasis added); *see Mayo*, 132 S. Ct. at 1300-02 (discussing *Morse*, *Benson* and *Bilski*).

In this context, merely embodying an abstract idea in a computer or another machine does not, by itself, preclude it from being abstract. *See CyberSource*, 654 F.3d at 1375-76 (quoting *Bilski*, 130 S. Ct. at 3231). For example, Claim 8 in *Benson*, was found by this Court to preempt an abstract idea, and thus to not be patent-eligible, even though it integrated traditional computer elements like a shift register in a meaningful way into the claimed steps. 409 U.S. at 71-72.

Accordingly, the crux of the patent-eligibility inquiry should properly focus on determining whether the claim as a whole preempts the use of the abstract idea. When it does not, such as when the computer-implemented application of the idea is one of multiple ways to apply the idea, the claim should be patent-eligible.

For example, Federal Circuit precedent, including *SiRF Technology, Inc. v. I.T.C.*, 601 F.3d 1319, 1333 (Fed. Cir. 2010), *Research Corp. Technologies*, *Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335 (Fed. Cir. 2013), *petition* *for cert. filed* (U.S. Aug. 23, 2013) (No. 13-255)[4] and other cases, provides useful guidance that helps distinguish between an abstract idea and the practical application of such an idea by listing certain specific, objective factors that can be considered. Factors suggesting patent-eligibility include:

- The claim is to a practical application of a concept;
- The claim includes limitations inextricably tied to the use of computers;
- The claim involves specific applications or improvements to technologies already in the marketplace;
- The claim involves controlled interactions over the internet or other network; and/or
- The abstract idea can be performed without infringing the claim.

On the other hand, factors tending to lead to the conclusion that a claim is not patent-eligible include:

- The claim preempts an abstract idea;

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[4] The NYIPLA recognizes that this Court's grant of *certiorari* and vacating of the first panel decision in *Ultramercial* may be understood as rejecting the "manifest abstractness" test advocated in this line of cases. *WildTangent, Inc. v. Ultramercial, LLC*, 132 S. Ct. 2431 (2012). Nevertheless, the NYIPLA respectfully submits that the factors set forth in those cases can serve as helpful guideposts dividing preempted abstract ideas from the patent-eligible practical application of such ideas.

- Limitations in the claim merely define a field of use, rather than a particular way of practicing the idea; and/or

- The claim merely says "apply it" with respect to a fundamental principle, without more.

In performing the analysis, the claim should be analyzed as a whole, and should not be parsed into new and old portions or dissected to remove computer portions to find the abstract principles buried within the claim. This Court made this requirement clear in, *e.g.*, *Diehr*:

> In determining the eligibility of respondents' claimed process for patent protection under § 101, ***their claims must be considered as a whole***. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made. The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.

450 U.S. at 188-89 (footnote omitted) (emphasis added); *see also Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057,1068 (Fed. Cir. 2011). Courts may not simply ignore claim limitations since, by statute, inventions are

defined in the claims by the patentee. 35 U.S.C. § 112 (2006). Thus, analysis of computer-implemented claims under Section 101 must account for all elements of those claims.

Despite this Court's reminder in *Mayo* that computer-implemented claims should not be rejected merely because they "at some level embody, use, reflect, rest upon, or apply . . . abstract ideas," 132 S. Ct. at 1293, some courts have misconstrued other language in *Mayo* to allow them to do just that. *See, e.g.*, *Bancorp*, 687 F.3d at 1279-80 ("When the insignificant computer-based limitations are set aside from those claims that contain such limitations, the question under § 101 reduces to an analysis of what additional features remain in the claims. *See Mayo*, 132 S. Ct. at 1297 (questioning, after setting aside the claimed law of nature, '[w]hat else is there in the claims before us?').").

The Association respectfully submits that any approach that allows a claim to be parsed in this manner is inconsistent with the Patent Act and this Court's precedent, and should be unequivocally rejected.[5]

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[5] *Cf. Accenture Global Servs. v. Guidewire Software, Inc.*, 728 F.3d 1336, 1348 (Fed. Cir. 2013) (Rader, J., dissenting) ("I take this opportunity to reiterate my view that 'the remedy is the same: consult then statute!' The statute offers broad categories of patent-eligible subject matter. The 'ineligible' subject matter in [Accenture's] system claims is a further testament to the perversity of a standard without rules—the result of abandoning the statute.") (citation omitted).

B. Objections Based on the "Mental Steps" Doctrine Can Be Overcome by Meaningfully Tying Claimed Steps to a Computer or Other Machine/Device

Under the "mental steps" doctrine, a claim that can be performed solely in a person's mind is considered "abstract" and patent-ineligible. *See, e.g., Diehr*, 450 U.S. at 196; *CyberSource*, 654 F.3d at 1373 (a claim "that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101"); *see also Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office*, 689 F.3d 1303, 1309 (Fed. Cir. 2012). Thus, "mental processes—or processes of human thinking—standing alone are not patentable even if they have practical application." *In re Comiskey*, 554 F.3d 967, 979 (Fed. Cir. 2009).

However, when one or more steps of such a claim are tied in a meaningful way to a machine or device, like a computer, the claim no longer runs afoul of the mental steps doctrine. *Cf. Classen*, 659 F.3d at 1065; *Ultramercial*, 657 F. 3d at 1329-30. Applying this distinction in *Classen*, the Federal Circuit found that those claims which included only mental steps ("correlation" steps that could be performed in the human mind) were not patent-eligible, while other claims that included both the same mental steps and additional physical implementations (*e.g.*, immunization) were patent-eligible under 35 U.S.C. § 101. 659 F.3d at 1066-68. A step that could have been performed in the human mind is no longer a purely mental step when performed by a computer or in conjunction with some other machine or mechanical implementation.

The NYIPLA respectfully submits that in this context, meaningfully tying claimed steps to a computer or other machine or device, as required under the traditional machine-or-transformation test, would overcome this type of objection.[6] Nonetheless, to the extent a claim preempts an abstract idea (or another fundamental principle) it may still be found patent-ineligible. Therefore, claims must still be analyzed under the framework set forth in Part II.A., *supra*, where the "abstract idea" at issue is first defined and the claim as a whole is then analyzed to determine if there are ways to practice this "abstract idea" that fall outside the scope of the claimed invention.

III. APPLICATION OF THE GUIDING PRINCIPLES TO THE ANALYSIS OF A COMPUTER-IMPLEMENTED INVENTION CLAIMED AS A METHOD, SYSTEM OR STORAGE MEDIUM

As to the issue of whether a claim's form as a method, system or storage medium should impact the Section 101 analysis, the NYIPLA respectfully submits that its particular form should not drive the analysis. *See Mayo*, 132 S. Ct. at 1294 ("patent eligibility [does not] 'depend simply on the draftsman's art'") (quoting *Flook*, 437 U.S. at 593); *cf. Quanta Computer, Inc. v. LG Elecs., Inc.*, 553 U.S. 617, 629-30 (2008) (warning of the danger of adopting certain rules for method claims and others for apparatus claims, where: "Patentees seeking to avoid [a particular result] could simply draft their patent claims to describe a method rather than an apparatus."). A proper analysis should not depend upon the form of the claims. This would elevate form over substance.

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[6] Likewise, other kinds of objections, such as a "printed matter" objection, might also be overcome by meaningfully tying the claim to a computer or other machine. *See, e.g., In re Lowry*, 32 F.3d 1579, 1583 (Fed. Cir. 1994) ("printed matter" objection overcome where "the invention as defined by the claims ***requires*** that the information be processed not by the mind but by a machine") (citation omitted).

In addition, as noted in Part II.B, *supra*, it is crucial that a claim be analyzed as a whole. Because each claim (regardless of its type) should be considered independently as a whole, the NYIPLA believes that method, system and storage medium claims should not *ipso facto* rise and fall together.

CONCLUSION

The NYIPLA supports the articulation of fair and reasonable principles that can be predictably applied and clearly define the bounds of patent-eligible subject matter. For this reason, the NYIPLA respectfully urges the Court to set forth the useful guidelines, discussed herein, for determining when a computer-implemented claim preempts an abstract idea, and is thus patent-ineligible, and when it merely claims an application of an abstract idea, and is thus patent-eligible.

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IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.
CLS BANK INTERNATIONAL, *et al.*,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF *AMICUS CURIAE* PROOVE BIOSCIENCES, INC. IN SUPPORT OF NEITHER PARTY

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INTEREST OF *AMICUS CURIAE* PROOVE BIOSCIENCES[1]

Proove Biosciences[2] is one of the world's leading providers of personalized medicine and medical research services. From its laboratory facilities in Southern California, the company provides physicians and the medical community with information to improve the selection, dosing, and evaluation of medications and also offers proprietary laboratory testing.

Proove Biosciences has a patent portfolio of pending patent applications that involve computer-related implementations of genetic testing. These aspects of the patent portfolio are related to the patent eligibility issues under 35 U.S.C. § 101 which are being considered in this case.

Outside of any potential impact on its patent portfolio, Proove Biosciences has no stake in the outcome of this case, other than its desire for a correct and clear interpretation and application of the United States Patent Laws.

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[1] No counsel for a party authored this brief in whole or in part, and no party or counsel for a party made a monetary contribution intended to fund the preparation or submission of this brief. No one other than Proove Biosciences made a monetary contribution to the preparation or submission of this brief. Both parties have granted blanket consent to the filing of amicus briefs.

[2] "Proove Biosciences" refers to Proove Biosciences, Inc., a corporation incorporated in the state of Delaware and owner of several U.S. patent applications.

SUMMARY OF THE ARGUMENT

The Court should endorse the analytical framework laid out in Chief Judge Rader's opinion in *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc). The framework includes a "claim as a whole" test, consistent with *Diamond v. Diehr*, 450 U.S. 175 (1981), that represents an incremental clarification of this Court's foundational precedents for evaluating computer inventions under 35 U.S.C. § 101. An incremental change is favored as the Court has warned that "courts must be cautious before adopting changes that disrupt the settled expectations of the inventing community." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 739 (2002) (citing *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 28 (1997)).

Chief Judge Rader's analytical framework embraces the machine-or-transformation test the Court endorsed in *Bilski v. Kappos*, 130 S. Ct. 3218 (2010), for evaluating patent eligibility of computer inventions under 35 U.S.C. § 101. Also, the "claim as a whole" test represents a level of consensus with Judge Lourie's opinion in *CLS Bank en banc*. Furthermore Chief Judge Rader's analytical framework is fully consistent with the text of 35 U.S.C. § 101 and the Court's other opinions on this issue including (but not limited to) *Gottschalk v. Benson*, 409 U.S. 63 (1972); *Parker v. Flook*, 437 U.S. 584 (1978); and *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012). It is also significantly aligned with the previously established test from *State Street Bank and Trust*

Company v. Signature Financial Group, Inc., 149 F.3d 1368 (Fed. Cir. 1998).

ARGUMENT

I. The Court should endorse the analytical framework laid out in Chief Judge Rader's opinion in *CLS Bank en banc*, including a "claim as a whole" test, consistent with *Diehr*, as a supplement to the machine-or-transformation test the Court has endorsed in *Bilski v Kappos*.

The Federal Circuit has visited the question before this Court – whether claims to computer-implemented inventions are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court – several times in recent years.

In 1998, in *State Street Bank*, a panel of the court enunciated the principle that claims to a computer invention in a business method involving an algorithm as an abstract idea were patent-eligible if the claimed invention involved a "practical application" and produced "a useful, concrete and tangible result." *State Street Bank*, 149 F.3d at 1373. The test in *State Street Bank* was well accepted in the courts below for several years for determining patent-eligible subject matter in computer inventions involving abstract concepts, algorithms and business methods.

However, in *In re Bilski* 545 F.3d 943 (Fed. Cir. 2008) (en banc), the court effectively replaced the test from *State Street Bank* with a new test for patent eligibility for computer inventions under 35 U.S.C. § 101. Known as the machine-or-transformation test, the court in *In re Bilski* pronounced "A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." *In re Bilski*, 545 F.3d at 954, citing *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972).[3] The Federal Circuit also pronounced that the machine-or-transformation test was the sole test available for determining patent eligibility of computer-implemented inventions under 35 U.S.C. § 101. *In re Bilski*, 545 F.3d at 956. Thus, in effect, the "practical application" producing a useful-concrete-tangible result test from *State Street Bank* was discarded.

In re Bilski was appealed and heard by the Court in *Bilski v. Kappos*. Justice Kennedy delivered the Court's opinion endorsing the machine-or-transformation test as informative, but dismissing its exclusive use for determining patent eligibility of computer inventions under 35 U.S.C. § 101. Slip Op. at p. 8. ("The machine-or-transformation test is not the sole test for patent eligibility under §101. The Court's precedents establish that although that test may be a useful and important clue or investigative tool, it is not the sole test for deciding whether an invention is a patent-eligible "process" under §101.").

Justice Kennedy emphasized that the Court's opinion in *Bilski v. Kappos* did not also endorse other interpretations of §101 that the Federal Circuit had used in the past, including the test in *State Street Bank*. However, Justice Kennedy did urge "the Federal Circuit's development of other limiting criteria that further the purposes of the Patent Act and are not inconsistent with its text", and yet are consistent with the Court's prior opinions, including *Benson*, *Flook*, and *Diehr*. Slip Op. at p. 16.

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[3] But see "It is argued that a process patent must either be tied to a particular machine or apparatus or must operate to change articles or materials to a "different state or thing." We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents." 409 U.S. 63, 71.

The Federal Circuit reheard *CLS Bank en banc* hoping to develop a more comprehensive standard than the machine-or-transformation test for evaluating computer inventions under 35 U.S.C. § 101. But instead of clarifying the criteria for determining patent eligibility, the en banc court produced a one-paragraph *per curiam* opinion, five concurring and dissenting opinions, and "additional reflections" by Chief Judge Rader. Pet. App. 1a-131a.

Three of the judges in *CLS Bank en banc* wrote opinions proposing different analytical frameworks for determining patent eligibility. Judge Lourie and Judge Linn both delivered opinions that proposed analyses that appear to go well beyond any test which has been adopted previously at the Federal Circuit. However, Chief Judge Rader delivered an opinion[4] proposing an analytical framework that is consistent with the text of 35 U.S.C. § 101, embraces the machine-or-transformation test endorsed in *Bilski v. Kappos* and is well-supported by the Court's other opinions on this issue. Furthermore, the analytical framework in

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[4] Judges Linn and O'Malley joined in the Chief Judge Rader's opinion, and Judge Moore joined in-part.

Chief Judge Rader's opinion is significantly aligned with the "practical application" aspect of the test from *State Street Bank.*

The analytical framework proposed in Chief Judge Rader's opinion is based on the observation that the "abstract idea" exception to patent-eligibility under 35 U.S.C. § 101, which the Court has identified, focuses on whether "the asserted claim *as a whole*" covers "merely an abstract idea." Pet. App. 53a-54a. Reviewing the claim "*as a whole*" is essential, because "[a]ny claim can be stripped down, simplified, generalized, or paraphrased to remove all of its concrete limitations, until at its core, something that could be characterized as an abstract idea is revealed." Id. at 54a. Citing *Diehr*, 450 U.S. at 188 (emphasis added).

Chief Judge Rader explained that in determining whether a claim, as a whole, covers merely an abstract idea, the relevant inquiry is whether the claim "includes meaningful limitations restricting it to an application." Pet. App. at 57a. Citing *Prometheus*, 132 S. Ct. at 1297 ("[D]o the patent claims add *enough* to their statements of the correlations to allow the processes they describe to qualify as patent-eligible processes that *apply* natural laws?" (emphasis in original)) A claim that pre-empts or "covers all practical applications of an abstract idea," or that "contains only insignificant or token pre- or post-solution activity" "is not meaningfully limited." Pet. App. at 58a-60a. Citing *Prometheus*, 132 S. Ct. at 1297-98; *Bilski*, 130 S. Ct. at 3230-31; *Diehr*, 450 U.S. at 191-92 & n.14; and *Parker v. Flook*, 437 U.S. 584, 595 n.18. ("Preemption is only a subject matter eligibility problem when a claim preempts all practical uses of an abstract idea. For example, the claims in *Benson* "purported to cover any use of the claimed method in a general-purpose digital computer of any type." Citing *Benson* 409 U.S. at 64. The claims were not allowed precisely because they pre-empted essentially all uses of the idea.")

Chief Judge Rader further clarified the analysis regarding computer-implemented inventions in that, as applied to a computer-implemented claim, the meaningful-limitation inquiry asks "whether the claims tie the otherwise abstract idea to a specific way of doing something with a computer, or a specific computer for doing something; if so, they likely will be patent eligible, unlike claims directed to nothing more than the idea of doing something on a computer." Pet. App. at 62a. Citing *Bilski*, 130 S. Ct. at 3227; *Prometheus*, 132 S. Ct. at 1302-03; *Diehr*, 450 U.S. at 184, 192. ("[T]he respondents here do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process."); *see also Prometheus*, 132 S. Ct. at 1298-99 and *Diehr*, 450 U.S. at 187, ("a claim does not become non-statutory simply because it uses a mathematical formula, computer program, or digital computer" because "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

The analytical framework in Chief Judge Rader's opinion in *CLS Bank en banc* thus represents an incremental clarification of the law for evaluating computer inventions under 35 U.S.C. § 101. The framework embraces the machine-or-transformation test the Court endorsed in *Bilski* for evaluating patent eligibility of computer inventions under 35 U.S.C. § 101. Furthermore, the test is fully consistent with the text of 35 U.S.C. § 101 and the Court's other opinions on this issue, including *Benson*, *Flook*, *Diehr*, and *Prometheus*. To help resolve the uncertainty that has developed at the Federal Circuit, *amicus curiae* Proove Biosciences respectfully urges the Court to endorse the analytical framework of Chief Judge Rader's opinion in *CLS Bank en banc*.

II. The Court's endorsement of a "claim as a whole" test, consistent with *Diehr*, would achieve a level of consensus between Judge Lourie's opinion and Chief Judge Rader's in *CLS Bank en banc*.

Despite the plurality of opinions, Judges Lourie, Dyk, Prost, Reyna and Wallach, in the concurring opinion delivered by Judge Lourie, paid great deference to the *Diehr* opinion, reciting the case as a "Foundational Section 101 Precedent", and to the holding in *Dier* that a claim be drawn to a specific application to satisfy 35 U.S.C. § 101. *CLS Bank*, 717 F.3d at 1279 ("[A]n application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.") Citing *Diehr*, 450 U.S. at 187. ("Because the applicant claimed a specific application, rather than an abstract idea in isolation, the claims satisfied § 101.") *CLS Bank*, 717 F.3d at 1279. ("[A] patent-eligible claim must include one or more substantive limitations that, in the words of the Supreme Court, add "significantly more" to the basic principle, with the result that the claim covers significantly *less*." *CLS Bank*, 717 F.3d at 1281. (emphasis in the original)

Judges Lourie also emphasized, as part of his analytical framework, that "the claim can be evaluated to determine whether it contains additional substantive limitations that narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself." Citing *Mayo*, 132 S.Ct. at 1300. *CLS Bank*, 717 F.3d at 1282. (discussing a patent-eligible process claim that involved a law of nature but included additional steps "that confined the claims to a particular, useful application of the principle"). *Id.* at 1282. Thus, the Court's endorsement of a "claim as a whole" test, consistent with *Diehr*, would achieve a level of consensus between Judge Lourie's opinion and Chief Judge Rader's in *CLS Bank en banc*.

CONCLUSION

The Court should endorse the analytical framework for determining patent eligibility in Chief Judge Rader's opinion in *CLS Bank en banc*, including the "claim as a whole" test, to resolve the conflict at the Federal Circuit over the patent eligibility of computer-related inventions under 35 U.S.C. § 101.

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ON WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

BRIEF OF PUBLIC KNOWLEDGE AND THE APPLICATION DEVELOPERS ALLIANCE AS *AMICI CURIAE* IN SUPPORT OF RESPONDENTS

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INTEREST OF *AMICI CURIAE*

Public Knowledge is a non-profit organization that is dedicated to preserving the openness of the Internet and the public's access to knowledge; promoting creativity through balanced intellectual property rights; and upholding and protecting the rights of consumers to use innovative technology lawfully. As part of this mission, Public Knowledge advocates on behalf of the public interest for a balanced patent system, particularly with respect to new and emerging technologies.[1]

Public Knowledge has previously served as *amicus* in key patent cases. *E.g.*, *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238 (2011); *Bilski v. Kappos*, 130 S. Ct. 3218 (2010); *Quanta Computer, Inc. v. LG Elecs. Corp.*, 553 U.S. 617 (2008).

The Application Developers Alliance (ADA) is a non-profit industry association comprising more than 30,000 individual software developers and more than 150 companies who design and build applications ("apps") for consumers to use on mobile devices like smartphones and tablets. Apps run on software platforms, including Google's Android, Apple's iOS, and Facebook, and are sold or distributed through virtual stores like Google's Play Store. ADA is dedicated to meeting the needs of app developers as creators, innovators, and entrepreneurs, by delivering essential information and resources and by advocating for public policies that promote the app ecosystem.

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[1] Per Supreme Court Rule 37(6), no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of the brief. No person or entity, other than *amici*, their members, or their counsel, made a monetary contribution to the preparation or submission of this brief. Per Rule 37(3)(a), consent has been granted for the filing of this brief, as indicated by the blanket consents from counsel for petitioner and counsel for respondents docketed December 11, 2013.

App developers are both central to innovation and vulnerable to the patent laws that surround innovation. By innovating rapidly and cheaply, app developers represent an increasingly robust force in the economy. The app economy is now globally valued at over $53 billion and has created approximately 466,000 jobs in the United States since 2007.[2] But many app developers, including ADA members, are struggling as a result of abusive patent assertion, especially that originating from patent assertion entities (PAEs). Such entities often assert overly broad patents, propounding unfounded infringement allegations and aggressive litigation threats, which deeply chill innovation.[3]

Inconsistency and uncertainty in areas of patent law, such as subject matter eligibility, are enabling factors in PAE litigation, as they enable aggressive patent assertors to take improper, overbroad positions. *E.g.*, *Eon-Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1326–28 (Fed. Cir. 2011). This forces many app developers to conclude that innovation is not worth the expensive baggage of defending against such claims, resulting in delays to and deficiencies in app development and overall innovation.[4] Thus, ADA and its members have a strong interest in this Court providing clarity in this area of patent law.

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[2] Andreas Pappas, VisionMobile Ltd., *App Economy Forecasts 2013–2016* (2013); Michael Mandel, *Where the Jobs Are: The App Economy* 13 (2012).

[3] Brief *Amicus Curiae* of Application Developers Alliance in Support of Petition for Certiorari, *WildTangent, Inc. v. Ultramercial, LLC*, No. 13-255 (U.S. Sept. 23, 2013).

[4] *See, e.g.*, Colleen V. Chien, New Am. Found., *Patent Assertion and Startup Innovation* 17 (2013), http://www.newamerica.net/publications/policy/patent_assertion_and_startup_innovation.

SUMMARY OF ARGUMENT

Abstract ideas are not eligible for patenting because, as this Court has steadfastly maintained, certain fundamental subject matter must be fixed in the public domain, so that patents may serve their constitutional mandate to "promote the Progress of Science and the useful Arts." Being the basic tools of innovation, abstract ideas must remain available to the public; to do otherwise would impede innovation more than promote it.

This case tests how far a patent may encroach on that valuable domain reserved to innovators, creators, and the public. Petitioner holds patents to computer technology. The patent claims at issue are lengthy and detailed, some over two hundred words long. But those claims actually cover very simple ideas; the verbose language is a mere facade masking basic concepts.

To demonstrate this, *amici* have implemented one of those 200-word claims—in just 7 lines of computer code.

This computer program shows that the patent claims are directed to nothing more than an abstract idea implemented on a general-purpose computer, which should not be patent-eligible. To hold otherwise would contravene this Court's precedent and undermine the rationale for unpatentability of abstract ideas. Such "abstract-idea-plus-computer" patents would be effective monopolies on the basic tools of innovation, a result that this Court has adamantly rejected.

To prevent further errors of this sort, *amici* identify three points of clarification on the law of subject matter eligibility, and urge this Court to enunciate these specific points. Doing so not only will correct the judgment below and guide the lower courts, but also will ensure that those valuable basic tools of innovation remain available to all.

ARGUMENT

This case presents the recurrent question of what constitutes patentable subject matter, particularly with regard to the fields of computer software and business methods. *Amici* address two aspects of this question as they relate to the present case. First, *amici* show that the patented claims at issue are directed to ineligible abstract ideas, by implementing one of those claims in seven lines of computer code. Figure 1 *infra* p. 7. Second, in view of the fractured opinions of the Federal Circuit below, *amici* suggest three principles for guiding the lower courts in deciding future cases.

I. THE CLAIMS AT ISSUE ARE INELIGIBLE FOR PATENTING BECAUSE THEY PREEMPT AN ABSTRACT IDEA

The question presented is whether Petitioner's claims are directed to patent-eligible subject matter. Generally, "any new and useful process, machine, manufacture, or composition of matter" is eligible for patenting. 35 U.S.C. § 101 (2013). But three particular fields are nevertheless ineligible: laws of nature, physical phenomena, and abstract ideas. *E.g., Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012) (quoting *Diamond v. Diehr*, 450 U.S. 175, 185 (1981)).

The claims of these patents, as with many patents in the computer technology field, are full of complex technical language. But these claims actually present very basic concepts—so basic, in fact, that *amici* have prepared a seven-line computer program that implements all the features of one of the most complex claims. The program, shown in Figure 1 on page 7, demonstrates that the claims recite not specialized, technical systems, but rather a simple algorithm that reduces to nothing more than an abstract idea run on a computer. Because mere application of a general-purpose computer should not render an otherwise abstract idea patentable, *amici* urge this Court to find the present claims ineligible.

A. THE CLAIMS CAN BE IMPLEMENTED IN JUST SEVEN LINES OF COMPUTER CODE

Much of the disagreement in the lower court's fractured decision stemmed from a dispute over the nature of the patent claims at issue. Judge Lourie, writing for five judges, found the claims to recite "a handful of computer components in generic, functional terms that would encompass any device" and unduly preempt an abstract idea. *See CLS Bank Int'l v. Alice Corp.*, 717 F.3d 1269, 1290 (Fed. Cir. 2013) (en banc). Judge Rader, writing for four judges, found those same claims narrowly tailored, "limited to an implementation that includes at least four separate structural components" rendering the claim patent-eligible. *See id.* at 1307.

The claims at issue do use technical-sounding, complex language, making them appear to be directed to a narrowly tailored invention. One of the claims at issue recites, among other things, a "communications controller," a "data storage unit," and an "instruction being an irrevocable, time invariant obligation." U.S. Patent No. 7,725,375 claim 26, cols. 66–67 (filed June 27, 2005).[5]

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[5] Claim 26 of the '375 Patent is considered in this brief because it was found patentable by the greatest number of judges of the lower court decision. *See CLS Bank*, 717 F.3d at 1309 (Rader, Linn, Moore & O'Malley, JJ.); *id.* at 1327 (Newman, J.). *Amici* could have easily used any other claim at issue. For reference, Claim 26 is reprinted in Appendix B *infra* p. 8a.

But beneath this veneer of technical language is nothing more than a very simple, basic idea. As a demonstration, the computer program shown in Figure 1 on the opposite page implements all the features of Claim 26 of the '375 Patent. A complete explanation of the working of this program as it relates to Claim 26 of the '375 Patent is presented in Appendix A *infra* p. 1a.

As this Court will observe, the computer program is only seven lines long, indicating that the verbose language of the claims does not in fact demand specific, particular implementations but rather expansively preempts all uses of a simple, basic idea. Compared to ordinary computer programming, a seven-line computer program is remarkably simple:

- A single page of the Supreme Court's website is 926 lines long, including 145 lines of computer code.[6]
- A fourteen-year-old wrote an iPhone app with over 11,000 lines of code.[7]
- The computer program that formatted the citations and table of authorities of this brief is 7,939 lines long.[8]

Certain judges below were misled by the language of the claims and the patent. Judge Rader believed that Claim 26 involved "a complex problem" that could only be solved with a specialized system with "at least four separate structural components." *CLS Bank*, 717

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[6] *Supreme Court of the United States* (last updated Feb. 21, 2014), http://www.supremecourt.gov/.

[7] Taylor Buley, *World's Youngest iPhone App Developer?*, Forbes, Mar. 30, 2010, http://www.forbes.com/2010/03/30/apple-iphone-developer-technology-teenager.html.

[8] That program, which was written by counsel of record on this brief, is available at https://github.com/charlesduan/legcite.

```
10 LET account1 = 200.00
20 LET account3 = 300.00
30 INPUT "Value to exchange for transaction"; exchange
40 IF account1 < exchange THEN PRINT "Inadequate
    value" : STOP
50 account1 = account1 − exchange
60 account3 = account3 + exchange
70 PRINT "Instruction to 1st institution: adjust 2nd
    account by "; −exchange
```

Figure 1: Implementation of Claim 26 of the '375 Patent.

F.3d at 1307. He reviewed the "at least thirty two figures which provide detailed algorithms" to conclude that "[l]abeling this system claim an 'abstract concept' wrenches all meaning from those words." *Id.* at 1309. Judge Moore likewise found a similarly-worded claim "limited to one that is configured to perform certain functions in a particular fashion" and, based on one of the flowcharts, suggested that the claims demanded a dizzyingly long and complex algorithm. *Id.* at 1318. And Judge Linn concluded that, while they may be based on an abstract idea, "the claims here are directed to very specific ways of doing that." *Id.* at 1741.

The common thread among all of these opinions is an assumption that, given the heavy use of technical language in the specification and claims, only a specific, complex, technical computer program could infringe the patents. As the seven-line computer program on the previous page demonstrates, this assumption was in error.

The computer program devised by *amici* reads the claim as a whole, as this Court requires. *See Diamond v. Diehr*, 450 U.S. 175, 188 (1981). As the detailed appendix shows, every claim limitation is considered and implemented appropriately in the computer code, so it cannot be said that details or limitations have been stripped from the claim. *See* Appendix A *infra* p. 1a; *cf. Diehr*, 450 U.S. at 188 ("It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis."). Furthermore, because the computer program is a functional, working implementation of the claim, it cannot be argued that it is a mere abstraction or generalization of the claims.

Thus, Claim 26 of the '375 Patent is directed not to a complex system requiring specialized hardware, but rather to a basic, seven-line computer algorithm.

B. THE CLAIMS COVER ALL COMPUTER IMPLEMENTATIONS OF AN ABSTRACT IDEA

The example computer program shows that the asserted claims, though lengthy and technical in appearance, are actually directed only to a very simple, basic computer procedure. In fact, the asserted claims would cover substantially all computer uses of the abstract idea of accounting by a third-party escrow.

This Court's precedent lays out several guidelines for determining whether a claim is directed to an abstract idea. "A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (quoting *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 175 (1853)). Furthermore, "conventional or obvious" post-solution or pre-solution activity cannot render a claim eligible, because otherwise "a competent draftsman could attach some form of post-solution activity" to "transform an unpatentable principle into a patentable process." *Parker v. Flook*, 437 U.S. 584, 590 (1978); *see also Mayo*, 132 S. Ct. at 1300 (holding "conventional steps, specified at a high level of generality," to similarly not confer patent eligibility).

According to these guidelines, it is clear that every element of Claim 26 is (1) an inherent aspect of the abstract idea of third-party escrow, (2) a conventional component of a general-purpose computer, or (3) insignificant pre- or post-solution activity. The claim is therefore ineligible.

Elements[9] 1–2 of the claim describe ordinary components of a general-purpose computer. *See* Appendix A *infra* p. 2a. "Communications controller" and "first party device" are broad, general terms that encompass basic computer components for interacting with users.[10] Furthermore, these two components are only recited in conjunction with a step of receiving data, which as explained below is insignificant pre-solution activity.

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[9] This brief references elements by numbers corresponding to the claim reprinted in the appendix. *See* Appendix B *infra* p. 8a.

Elements 3–5 describe basic record-keeping operations inherent in the idea of third-party escrow. Although the claim language verbosely describes a "data storage unit" with "information about a first account" and second account, the computer program demonstrates that these elements in fact require nothing more than recording two numbers in a computer. *See* Appendix A *infra* p. 3a. Certainly one would necessarily store such account information as part of an escrow service.[11]

Element 6 recites "a computer," and as such only further describes a general-purpose computer.

Element 7 states that the computer must "receive a transaction." This Court and others have repeatedly held that steps of obtaining data to be used for processing constitute insignificant pre-solution activity. *See, e.g., Mayo*, 132 S. Ct. at 1297–98 (treating as pre-solution activity a step of determining a level of metabolites prior to adjusting a treatment); *In re Meyer*, 688 F.2d 789, 794 (C.C.P.A. 1982) ("[A] data gathering step . . . cannot make an otherwise nonstatutory claim statutory."). As such, this claim element does not contribute to the eligibility of the claim.

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[10] *See* Alan M. Turing, *On Computable Numbers, with an Application to the* Entscheidungsproblem, 42 Proc. London Mathematical Soc'y 230, 231–32 (1936) (describing the Turing machine, a fundamental model for all computers, as including a "paper tape" for communicating with the user).

[11] The "data storage unit" is an essential part of a general-purpose computer. *See* Turing, *supra*, at 231–32 (further explaining that the Turing machine includes an *m*-configuration for storing the state of the machine).

Element 8 describes two steps to be performed by the computer, both of which are inherent in the idea of third-party escrow. First, the computer is tasked with "ensuring that said first party and/or said second party have adequate value" in their accounts. The computer code shows that this amounts to nothing more than a comparison, checking whether an account balance is greater than an amount to be transferred out of that account. *See* Appendix A *infra* p. 5a. This is the basic purpose of a third-party escrow broker, who must ensure that the parties' accounts contain sufficient funds.

Second, Element 8 requires the computer to "electronically adjust said first account and said third account." This operation, which amounts to only two lines of computer code, is inherent in any third-party escrow service, which must adjust account balance records to account for a transaction.

Element 9 instructs that the computer "generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account." Despite its fifty-nine-word length, this element reduces to a single operation: producing a message describing the transaction just completed. *See* Appendix A *infra* p. 6a. This elementary output step is quintessential post-solution activity that should not contribute to the eligibility of the claim. *Cf. Flook*, 437 U.S. at 590 (treating as post-solution activity a step of adjusting an alarm limit following a computation).

Claim 26 is directed to nothing more than an abstract idea of third-party escrow, in conjunction with insignificant pre-solution and post-solution activity, and ordinary—albeit verbosely described—components of a general purpose computer. This Court should accordingly hold the claim, and all others like it, unpatentable.

C. CLAIMS THAT PREEMPT SUBSTANTIALLY ALL COMPUTER IMPLEMENTATIONS OF AN ABSTRACT IDEA SHOULD BE INELIGIBLE

This Court should hold that the recitation of a general-purpose computer, as in the claims at issue here, does not render the claims eligible under § 101. This principle follows, first, from the goal of promoting innovation, a goal central to this Court's § 101 doctrine, and second, from the rules of law this Court has derived from these principles.

The abstract ideas exception is grounded in the principle that certain fundamental subject matter must be fixed in the public domain, so that patents may serve their constitutional mandate to "promote the Progress of . . . the useful Arts." U.S. Const. art. 1, § 8, cl. 8. Abstract ideas are unpatentable because they are "the basic tools of scientific and technological work," *Benson*, 409 U.S. at 67, and must remain "free to all men and reserved exclusively to none," *Bilski v. Kappos*, 130 S. Ct. 3218, 3218 (2010) (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948)). "[M]onopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it." *Mayo*, 132 S. Ct. at 1293; *accord Bilski*, 130 S. Ct. at 3228 (patent law must avoid "granting monopolies over procedures that others would discover by independent, creative application of general principles").

To permit patents on abstract ideas merely tied to general-purpose computers would eviscerate this principle. Computers are in widespread use today, and they are essential to innovation and a productive economy. *See, e.g.*, Erik Brynjolfsson & Adam Saunders, *Wired for Innovation: How Information Technology Is Reshaping the Economy* 4 (2010). Allowing patents on abstract ideas merely tied to computers would relegate innovators to practicing abstract ideas on pencil and paper. Needless to say, given the general importance of computers, such an absurd state of affairs would cripple innovation. The basic tools of innovation must remain available to all, even when they are, or must be, implemented on general-purpose technologies.

As an analogy, consider a patent claim directed to long division performed with pencil and paper. Long division can, in theory, be practiced in the mind, but as a practical matter no ordinary person can do so. Thus, this pencil-and-paper patent would effectively make the abstract idea of long division unusable. Similarly, computers are capable of tasks that ordinary humans cannot perform unaided, even though those tasks may be abstract ideas. The public must be able to apply these abstract ideas to computers if those abstract ideas are to remain "free to all men and reserved exclusively to none."[12]

In view of this important principle, this Court taken a practical, substantive approach to assessing the actual, effective scope of the claims. So, for example, "limiting the reach of the patent . . . to a particular technological use" does not render an abstract idea patentable. *Diehr*, 450 U.S. at 192 n.14. Nor does attachment of "post-solution activity," *Flook*, 437 U.S. at 584, or recitation of "well-understood, routine, conventional activity previously engaged by researchers in the field," *Mayo*, 132 S. Ct. at 1300.

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[12] Advances in computer hardware are of course themselves eligible for patent protection. *See CLS Bank*, 717 F.3d at 1292 (Lourie, J., concurring) (observing in dicta that computers *per se* are "surely patent-eligible machines"). Equally so would be advances in pencil technology. But these are distinguishable from mere annexation of abstract ideas to computers or pencils.

Based on this clear precedent, *amici* urge this Court to hold that attachment of a general-purpose computer or other common platform does not render an abstract idea patentable, in the present claims or otherwise. Implementing an abstract idea in the form of an algorithm on a general-purpose computer is a "well-understood, routine, conventional activity," *id.*, that merely applies the algorithm in a "particular technological environment," *Bilski*, 130 S. Ct. at 3230 (quoting *Diehr*, 450 U.S. at 191–92). Any "competent draftsman" could append elements of a general-purpose computer to any algorithm. This case is distinguishable from *Diehr*, which found patentable an algorithm intimately tied to a rubber-curing machine, *see* 450 U.S. at 187, because unlike a rubber-curing machine, a computer is able to perform *any* possible algorithm or mathematical procedure. Thus, in the claims at issue, the recitation of a general-purpose computer should not render the claims eligible under § 101.

II. THIS COURT SHOULD CLARIFY THE LAW OF SUBJECT MATTER ELIGIBILITY

In past decisions, this Court has placed important limits on patentable subject matter to ensure that the building blocks of invention, including abstract ideas and laws of nature, remain available to all. *Mayo*, 132 S. Ct. at 1293. The flood of software patent litigation in recent years, and the ruthless exploitation of such litigation by patent assertion entities, have made these limitations more important than ever. U.S. Gov't Accountability Office, *Intellectual Property: Assessing Factors that Affect Patent Infringement Litigation Could Help Improve Patent Quality* 13 (2013). However, recent Federal Circuit decisions have weakened these limitations and muddied the waters on patentable subject matter. *Id.*

This Court should now reaffirm the importance of § 101 limitations and reject the use of flawed analytical methods. In particular, this Court should instruct the lower courts not to rely on three red herrings: details in the specification, the statutory class of the claims, or the addition of details of a computer. By advising lower courts to consider eligibility carefully and thoroughly, this Court will help bring certainty to patent litigation and relief to innovators.

A. LOWER COURTS SHOULD NOT RELY ON SPECIFICATION DETAILS TO EVALUATE ELIGIBILITY

This Court should reaffirm that the proper focus of a § 101 subject matter inquiry is the scope of the patent claims, and that courts should not rely on language in the specification to decide whether claims are sufficiently concrete. This would resolve a division among the Federal Circuit judges on the proper role of implementation details in determining eligibility.

It has long been established that "the claims made in the patent are the sole measure of the grant." *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339 (1961); *accord Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 336 U.S. 271, 538–39 (1949) ("[I]t is the claim which measures the grant to the patentee."); *White v. Dunbar,* 119 U.S. 47, 51 (1886) (a claim is not "like a nose of wax"). Since 1836, the Patent Act has required claims that "particularly specify and point out the part, improvement, or combination." *Keystone Bridge Co. v. Phoenix Iron Co.,* 95 U.S. 274, 278 (1877); *accord* Act of July 8, 1870, ch. 230, § 24, 16 Stat. 198, 201. While patent claims are read in light of the specification and prosecution history, the claims alone determine patent scope. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005).

Specifications do not define the scope of an invention; they merely describe how to make and use the claimed invention. 35 U.S.C. § 112(a) (2013). Thus, specifications, by their nature, will almost certainly include some detailed, concrete implementations of the invention at hand.

However, "the complexity of the implementing software or the level of detail in the specification does not transform a claim reciting only an abstract concept into a patent-eligible system or method." *Accenture Global Servs., GMBH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1345 (Fed. Cir. 2013); *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 120 (1853) (holding ineligible a broad patent claim to electromagnetism, despite a specification disclosing patent-eligible telegraph technology).

It is therefore critically important that, when deciding whether a patent claim is directed to patentable subject matter, courts pay close attention to what is actually being claimed, and be vigilant to ensure that, regardless of specification details, the claims do not envelop abstract ideas, laws of nature, or physical phenomena.[13]

Here, Judge Lourie applied the correct approach, correctly observing that the claims were simply calling for "a handful of computer components, in generic, functional terms that would encompass any device capable of performing the same ubiquitous calculation, storage, and connectivity functions." *CLS Bank*, 717 F.3d at 1290.

Several other judges, however, mistakenly relied on examples in the specification in determining patent eligibility. For instance, Judge Rader concluded that the claims were directed to patentable subject matter, in part by looking to complex-looking flowcharts and descriptions in the specification. Referring to one claim, he wrote: "Lest it be said that these structural and functional limitations are mere conventional post-solution activity, *the specification explains implementation* of the recited special purpose computer system." *Id.* at 1307 (emphasis added). The opinion mistakenly relied on specification details to conclude that the claims are intricate and concrete, and in so doing missed that the claims themselves still recite basic, abstract concepts.

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[13] Use of the specification is appropriate for functional claims under § 112(f). *See* Mark Lemley, *Software Patents and the Return of Functional Claiming*, 2013 Wis. L. Rev. 905 (June 25, 2013). But neither party has raised this possibility.

This is not the first time the Federal Circuit has erred this way. In *Ultramercial, LLC v. Hulu, LLC*, the court found certain computer-implemented patent claims to be patent-eligible, and not abstract ideas, in part because of the "intricate and complex computer programming" in the specification. 722 F.3d 1335, 1350 (Fed. Cir. 2013). In doing so, the panel missed the highly abstract nature of the claims, which essentially cover basic e-commerce concepts. *See* Brief of Amicus Curiae Public Knowledge in Support of Petitioner at 8–10, *WildTangent, Inc. v. Ultramercial, LLC*, No. 13-255 (U.S. Sept. 23, 2013).

If this Court does not reject improper use of the specification to determine subject matter eligibility, the confusion in the case below and in *Ultramercial* will allow clever drafters to circumvent this Court's precedent on abstract ideas, simply by adding details to the specification. This danger is particularly acute for software patents, as it is easy to "recite common language ('boilerplate') that describes generic computers" but that does not meaningfully limit the claims. Matt Browning, Note, *Now You See Them, Now You Don't: The PTO's Rules on Claims and Continuations*, 23 Berkeley Tech. L.J. 247, 263 (208). If judges get lost in obfuscatory language in patent specifications, then many more abstract patents will be incorrectly held valid, which will encourage improper litigation and chill innovation.

Amici urge this Court to instruct the lower courts, in unequivocal terms, not to rely on specification details to determine subject matter eligibility.

B. SYSTEM CLAIMS ARE NOT MORE PATENT-ELIGIBLE THAN METHOD CLAIMS

This Court should reiterate that patent subject matter eligibility turns on the substance and not the form of patent claims, and direct the lower courts not to decide patent eligibility based on drafting decisions such as claiming "systems" as opposed to "methods."

It has long been established that drafting formalities should not distract from the substantive § 101 analysis. As this Court reaffirmed in *Mayo*, appending to an abstract idea a phrase such as "apply it" does not make otherwise ineligible subject matter suddenly patentable. 132 S. Ct. at 1294. To hold differently would permit clever drafting to maneuver around § 101's important limitations, and ignore the basic rationale behind this Court's exceptions to § 101. *See Flook*, 437 U.S. at 590. One concurring opinion below, however, urged exactly that wrong approach. *CLS Bank*, 717 F.3d at 1309 (Rader, J.).

In articulating these exceptions, this Court has time and again underscored the principle that patents must ultimately incentivize innovation. *Mayo*, 132 S. Ct. at 1293; *Bilski*, 130 S. Ct. at 3228 (Kennedy, J., op.). While many patents do serve this principle, any claim that covers an abstract idea, law of nature or physical phenomenon in fact deters innovation by taking away those "basic tools of scientific and technological work" available to all.

Benson, 409 U.S. at 67. Any other approach would create uncertainty and hesitation for innovators, who may decide that developing technologies or releasing products is prohibitively expensive. *See* Fed. Trade Comm'n, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* 74 (2011).

One such drafting formality at issue in the case below is the choice of statutory class, such as a system claim or method claim. Such claims are certainly different in theory: the former covers a machine while the latter covers a process with steps. But, particularly for software, the difference is merely a drafting exercise, because any method can be transformed into a system claim by reciting "a computer configured to perform certain steps" rather than claiming the steps alone.

Lower courts have long noticed that system and method claims can and sometimes do identify the same subject matter. One court, for example, observed that this Court's precedent on § 101 "applies equally whether an invention is claimed as an apparatus or process, because the form of the claim is often an exercise in drafting." *In re Johnson*, 589 F.2d 1070, 1070 (C.C.P.A. 1978) (quoted in *In re Alappat*, 33 F.3d 1526, 1542 (Fed. Cir. 1994)). Indeed, the Federal Circuit has previously held that "the form of the claims should not trump basic issues of patentability." *Bancorp Servs., LLC v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1277 (Fed. Cir. 2012); *accord CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1374 (Fed. Cir. 2011) ("[W]e look to the underlying invention for patent-eligibility purposes.").

Despite this precedent, some judges still rely too heavily on the statutory class of a claim. According to Judge Rader, the system claims in this case "do not claim only an abstract concept without limitations . . . because they require a machine." *CLS Bank*, 717 F.3d at 1309. Thus, Judge Rader held those system claims eligible, while holding method claims with nearly equivalent wording ineligible. *See id.* at 1312–13.

Judge Rader's reasoning inappropriately turns formalistic drafting practice into a substantive distinction. As Judge Lourie observed, the "method and system claims use similar and often identical language to describe those actions," so to have a threshold test turn on this designation would be unreasonable. *Id.* at 1289. He correctly determined that "despite minor differences in terminology . . . the asserted method and system claims require performance of the same basic process." *Id.* at 1290. To hold otherwise would allow the form of the claims to trump basic issues of patentability, and would elevate an exercise in drafting to substantive significance.

A formalistic approach to system and method claims would be more than a departure from Supreme Court precedent and long standing tradition; it would essentially make the abstract ideas exception a dead letter for a huge swath of patents in the computer arts. Judge Rader's reasoning implies that a patent attorney can turn practically any method—abstract or not—into patentable subject matter simply by relabeling that claim a "system" with a simple reference to a computer. This would contravene this Court's warning in *Flook* about the danger of the clever draftsman, and it would obliterate the purpose behind the abstract ideas exception. This Court should explicitly reject such a result.

Amici therefore urge this Court to reaffirm that lower courts must examine system and method claims with equal vigor, and that the entirety of § 101's applicability cannot turn on superficial drafting distinctions.

C. RECITATION OF DETAILS OF A GENERAL-PURPOSE COMPUTER DOES NOT AFFECT ELIGIBILITY

This Court should make clear that a clever draftsman cannot turn an abstract idea into patentable subject matter simply by reciting aspects of a general-purpose computer, regardless of the level of detail with which the claims describe the general-purpose computer. Several of the opinions below were unduly impressed by detailed, technical language that in fact recited nothing more than parts of a general-purpose computer, *supra* p. 6, and this Court should firmly reject that approach.

Consider a hypothetical ineligible claim to a method of performing long division using pencil and paper, as *amici* discuss above. One could recite at length the physical attributes of the pencil ("a pencil comprising a wooden shaft surrounding a cylindrical graphite barrel, the wooden shaft having a distal end including a rubber eraser, etc."). But such a recitation would affect neither the tendency of such a claim to effectively preempt use of an abstract idea, nor the ineligibility of the claim. Allowing patent eligibility to turn on this sort of insignificant detail "would make the determination of patentable subject matter depend simply on the draftsman's art," a result that this Court should seek to avoid. *Flook*, 437 U.S. at 593.

Just as details about a pencil should not confer patent eligibility, neither should details about a general-purpose computer. Thus, language from the claims at issue, such as "data storage unit" and "communications controller," should not affect the ineligibility of the claims. This Court should reaffirm this point clearly.

One reason that the lower courts make this error is that they place undue reliance on the 1994 Federal Circuit decision *In re Alappat*. Although that case actually dealt with a special form of oscilloscope, the lower court stated in dicta that "a general purpose computer in effect becomes a special purpose computer once it is programmed" with software. 33 F.3d 1526, 1545 (Fed. Cir. 1994). Courts have used this statement to support a mistaken conclusion that recitation of general-purpose computer hardware can confer patent eligibility. *See, e.g., CLS Bank*, 717 F.3d at 1305 (Rader, J.); *Ultramercial*, 722 F.3d at 1353.

This reliance on *Alappat* is mistaken because this Court's precedent regarding abstract ideas does not distinguish between whether something is labeled "general" or "special purpose." A compact disc becomes special-purpose when music is recorded on it, but no patent should issue on such a "special-purpose compact disc." 33 F.3d at 1553–54 (Archer, J., dissenting).

The law of subject matter eligibility does not turn on labels. It turns on whether a patented claim would preempt virtually all implementations of an idea, suppressing innovation along the way. This Court should thus reject the continued reliance of the lower courts on this dicta from *Alappat*.

By ensuring that patent eligibility does not turn on formal drafting practices, such as recitation of system-style claims or inclusion of details of general-purpose computer hardware, this Court will take § 101 analysis from the metaphysical confusion that the lower courts have created, and return it to first principles. At the core of those first principles, which date back to the drafting of the Constitution, are the imperatives that patents must be calibrated to promote innovation, and that the toolbox of abstract ideas must remain available to all. It is these principles that should guide this Court's decision.

CONCLUSION

For the foregoing reasons, *amici* respectfully submit that this Court should affirm the judgment below.

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APPENDIX A

Implementation of Claim 26 of the '375 Patent in Seven Lines of Computer Code

The following seven-line computer program, written in the BASIC programming language, implements Claim 26 of the '375 Patent.[1]

```
10 LET account1 = 200.00
20 LET account3 = 300.00
30 INPUT "Value to exchange for transaction"; exchange
40 IF account1 < exchange THEN PRINT "Inadequate
    value" : STOP
50 account1 = account1 – exchange
60 account3 = account3 + exchange
70 PRINT "Instruction to 1st institution: adjust 2nd
    account by "; –exchange
```

The text below reviews the elements of the claim in detail and explains how a general-purpose computer, running the above computer program, would satisfy all the elements of the claim. For convenience, the entirety of the claim is reprinted in the next appendix.

All of the computer programming techniques used here predate the patent. The earliest possible priority date of the patent is 1992. The BASIC language dates back to 1964. *See* Computation Ctr., Dartmouth Coll., *BASIC* (1964), *available at* http://bitsavers.trailing-edge.com/pdf/dartmouth/BASIC_Oct64.pdf. Thus, the computer techniques used in this brief were "well-understood, routine, conventional activity previously engaged in by researchers in the field" as of the priority date of the patent. *Mayo*, 132 S. Ct. at 1294; *cf. CLS Bank*, 717 F.3d at 1310 (Rader, J.) (asserting that the use of computers in the claims did not involve such conventional activity).

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[1] A BASIC program interpreter to run this program is available at http://www.vintage-basic.net/.

CLAIM 26, PREAMBLE:

A data processing system to enable the exchange of an obligation between parties, the system comprising:

The preamble recites that the claim covers a general purpose computing system, called a "data processing system" by the claim language. The recitation that the system is "to enable the exchange of an obligation" is a statement of field of use or intended use, which should not contribute to the scope of the claim. *See Bilski*, 130 S. Ct. at 3231 ("[L]imiting an abstract idea to one field of use . . . did not make the concept patentable."); U.S. Patent & Trademark Office, *Manual of Patent Examining Procedure* § 2103(I)(C) (8th ed., 9th rev. 2012) [hereinafter MPEP] (instructing that "statements of intended use or field of use" "may raise a question as to the limiting effect of the language in a claim").

CLAIM 26, ELEMENTS 1–2:

a communications controller,

a first party device, coupled to said communications controller,

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These elements recite general hardware inherent in a general purpose computer. A "communications controller" broadly refers to a component of a computer that receives and processes communications, and a "first party device" could refer to any computer hardware.[2] A computer must communicate with its users in order to be useful, so these components are necessary to any computer.

CLAIM 26, ELEMENTS 3–5:

a data storage unit having stored therein

(a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and

(b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

COMPUTER CODE, LINES 10–20:[3]

```
10 LET account1 = 200.00
20 LET account3 = 300.00
```

These elements of the claim simply require that a computer store two numbers representing account balances. The "data storage unit" might be any computer storage device, such as a hard disk or memory. The "information about" the first and third accounts broadly encompasses any account information, such as an account balance.

---

[2] Petitioner has at least once described the communications controller as a device "that allows communications over a wide-area network." Alice Corp. Pty. Ltd.'s Renewed Cross-Motion for Partial Summary Judgment as to Subject Matter Eligibility at 6, *CLS Bank Int'l v. Alice Corp.*, 768 F. Supp. 2d 221 (Dist. D.C. Sept. 22, 2010) (No. 1:07-cv-974) (Doc. No. 95). But the text of the patent belies that limited definition. *See* '375 Patent col. 7, ll. 46–57 ("A number of communications controllers . . . effect communications between the processing units and various external hardware devices . . . . A large range of communications hardware products are supported, and collectively are referred to as the stakeholder input/output devices." (reference numbers omitted)).

[3] Lines of code in BASIC are traditionally numbered as multiples of 10, so the first line is line 10, the second is line 20, and so on.

The recitations that the information be stored "independent from" various accounts maintained by exchange institutions are statements of intended use, which should not contribute to the patentability of the claim. Petitioners have never suggested that the external exchange institutions are necessary parties to infringement of their claims. Furthermore, so long as the two stored numbers reflect actual account balances in external banks, the "independent from" limitations are satisfied.

The computer code implements these elements of the claim by instructing a computer to store two account balances, into variables named *account1* and *account3*.

CLAIM 26, ELEMENT 6:

a computer, coupled to said data storage unit and said communications controller, that is configured to

This element is simply further recitation of details about a general purpose computer. Any computer would be coupled to a data storage unit, so that it might access data for processing, and be coupled to a communications controller, so that it may receive and output information.

CLAIM 26, ELEMENT 7:

(a) receive a transaction from said first party device via said communications controller;

COMPUTER CODE, LINE 30:

```
30 INPUT "Value to exchange for transaction"; exchange
```

According to this element, the computer receives a "transaction." An exchange of money between two accounts is one type of transaction. Indeed, Petitioners have described an "exchange" as an example of a transaction. (Petr.'s Br. 7.) Thus, this element requires nothing more than receipt of an instruction to transfer money between two accounts.

The computer code implements this element by requesting the user to input an amount of money to transfer between the first and third account. This is performed by the INPUT command. Upon running this line of code, a computer would print out the prompt message, and then await an outside user to enter a number indicating the amount of money to transfer. The amount to exchange is stored in a variable named *exchange*.

CLAIM 26, ELEMENT 8:

(b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and

COMPUTER CODE, LINES 40–60:

```
40 IF account1 < exchange THEN PRINT “Inadequate
    value” : STOP
50 account1 = account1 - exchange
60 account3 = account3 + exchange
```

This element describes two operations. First, a computer must check that at least one of the accounts has a large enough balance to permit the desired transfer of money (“ensuring that said first party . . . ha[s] adequate value in said first account”). Second, the computer must record the transfer by adjusting the balances of the accounts (“electronically adjust said first account and said third account”).

Note the substantial presence of inoperative language in this claim element. The recitation “in order to effect an exchange obligation arising from said transaction between said first party and said second party" does nothing more than reiterate that the computer is transferring money between accounts. Furthermore, the claim recites that the computer must ensure "adequate value in said first account and/or said third account," and the disjunctive "and/or" means that the claim element is satisfied if only one of those accounts is checked. *See* MPEP, *supra*, § 2103(I)(C) ("Language that suggests or makes optional but does not require steps to be performed . . . does not limit the scope of a claim or claim limitation.").

The computer code checks the account balances at the line numbered 40, which halts execution (with STOP) if the balance of *account1* is less than the amount to be exchanged. The code executes the transfer at the lines numbered 50 and 60, which deduct the amount to be exchanged from *account1* and add that amount to *account3*.

CLAIM 26, ELEMENT 9:

(c) generate an instruction to said first exchange institution and/or said second exchange institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

COMPUTER CODE, LINE 70:

```
70 PRINT "Instruction to 1st institution: adjust 2nd
     account by "; –exchange
```

This claim element requires only that a computer produce an instruction to perform the desired transfer of money. The claim element recites "an instruction to said first exchange institution and/or said second exchange institution," but the disjunctive "and/or" means that a single instruction suffices. Similarly, the recitation of an instruction "to adjust said second account and/or said fourth account" only requires an instruction with regard to a single account.

The requirement that the instruction be "an irrevocable, time invariant obligation" is merely a statement of intended use that should not contribute to the patentability of the claim. An instruction is simply a text, and the recipient of the instruction chooses whether to treat that text as irrevocable or time-invariant. Although this claim language could plausibly have been defined in the specification to require some sort of special format for the instruction, Petitioners have never identified any such special definition in any of their briefs to this Court, the Federal Circuit, or the district court,[4] and the specification contains neither term outside of the claims. Furthermore, even if these terms did have some special meaning, it would only dictate the content of the instruction text, and content of text does not contribute to patentability. *See id.* § 2106(I) ("a mere arrangement of printed matter" is not directed to statutory subject matter).

The computer code implements this element by causing a computer to print an instruction to adjust the second account. The instruction directs the first institution to deduct the amount *exchange* from the account.

---

[4] The district court briefs reviewed are identified on the docket as Documents Nos. 53, 54, 68, 95, and 99. The Federal Circuit briefs reviewed are identified on the docket as Documents Nos. 22, 33, 41, and 194.

APPENDIX B

CLAIM 26 OF THE '375 PATENT

Numbers, in square brackets, have been inserted before each element of the claim, to assist in referring to claim elements within the brief.

A data processing system to enable the exchange of an obligation between parties, the system comprising:

[1] a communications controller,

[2] a first party device, coupled to said communications controller,

[3] a data storage unit having stored therein

[4] (a) information about a first account for a first party, independent from a second account maintained by a first exchange institution, and

[5] (b) information about a third account for a second party, independent from a fourth account maintained by a second exchange institution; and

[6] a computer, coupled to said data storage unit and said communications controller, that is configured to

[7] (a) receive a transaction from said first party device via said communications controller;

[8] (b) electronically adjust said first account and said third account in order to effect an exchange obligation arising from said transaction between said first party and said second party after ensuring that said first party and/or said second party have adequate value in said first account and/or said third account, respectively; and

[9] (c) generate an instruction to said first exchange institution and/or said second exchange

institution to adjust said second account and/or said fourth account in accordance with the adjustment of said first account and/or said third account, wherein said instruction being an irrevocable, time invariant obligation placed on said first exchange institution and/or said second exchange institution.

AMICUS
CURIAE
BRIEF

No. 13-298

[illegible]
FEB 28 2014
[illegible]

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF *AMICUS CURIAE* RED HAT, INC., IN SUPPORT OF RESPONDENTS

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STATEMENT OF INTEREST OF *AMICUS CURIAE* RED HAT, INC.

Red Hat, Inc., is the world's leading provider of open source software and related services to enterprise customers.[1] Its software products are used by Wall Street investment firms, hundreds of Fortune 500 companies, and the United States government. Based in Raleigh, North Carolina, Red Hat has offices in 33 countries.

Red Hat's interest in this proceeding is based on its experience in the software industry and its commitment to the free and open source software community. Open source software is growing at an exponential rate,[2] and is already of strategic economic importance. It provides the technological backbone of many large corporations and supports essential functions of many national and regional governments. In addition, it is used daily by millions of individuals for such activities as web searching, email, online shopping, social media, and banking. It is found in devices as varied as mainframe computers, desktop computers, tablets, mobile phones, medical devices, aircraft, automobiles, and warships.[3]

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[1] No counsel for a party authored this brief in whole or in part, and no such counsel made a monetary contribution intended to fund the preparation or submission of this brief. No person other than amicus curiae or its counsel made a monetary contribution to its preparation or submission. Petitioner and Respondents have consented to the filing of this brief through blanket letters of consent filed with the Clerk's Office.

[2] According to a 2008 study, the amount of open source code was doubling every fourteen months. Amit Deshpande & Dirk Riehle, The Total Growth of Open Source, *in* PROCEEDINGS OF THE FOURTH CONFERENCE ON OPEN SOURCE SYSTEMS, 197, 207 (Springer Verlag 2008), *available at* http://dirkriehle.com/2008/03/14/the-total-growth-of-open-source/.

Open source software involves not only innovative products, but also a transformative means of production, and understanding it is important in considering the patent eligibility issue at bar. In brief, all software begins as plain text "source code." Programmers write and edit source code in human-readable programming languages that allow specification of software features and behavior at a high level of abstraction. Source code is typically translated by a program called a compiler into "object code" form, which basically consists of a series of instructions to be executed on a computer. Since object code consists of unintelligible strings of 1s and 0s, software is effectively illegible and unmodifiable without access to its source code. Open source software permits modification and improvement by making the source code available to the user.

The open source model produces software innovation through a mechanism of collaborative development that relies on free communication of ideas among large numbers of independent individuals and companies. It uses a combination of technological and legal means. Typically, an open source program originates as a community-based project whose members work together using tools such as email, mailing lists, Internet Relay Chat, bug reporting systems, wikis, source code repositories, and source code version control systems. These tools enable rapid communication among geographically dispersed software developers, and make it possible for large numbers of developers from many different backgrounds and organizations to work collaboratively. A community open source project makes its software publicly available in source code form, under licensing terms that grant very broad, royalty-free copyright permissions allowing further use, copying, modification, and distribution.

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[3] There are numerous widely used open source software programs. Examples include the Linux operating system kernel, the Apache web server, the Firefox web browser, the Eclipse integrated development environment, the OpenStack cloud computing platform, the Git distributed version control system, the WordPress blogging tool, and the GNU Compiler Collection (GCC). Open source software is essential for Google, Amazon, Facebook, and nearly every other modern technology company.

In making source code available and conferring broad copyright permissions, open source differs significantly from traditional proprietary software. A vendor of proprietary software generally develops the software in-house and provides only object code to the user subject to restrictive licenses that allow no rights to copy, modify, or redistribute that code. Such vendors also retain the source code as a trade secret.

The open source development model has proven to be highly effective in producing software of superior quality. Because there are many developers working as collaborators in a distributed fashion, innovation happens rapidly. Because of the many who volunteer their time,[4] and the availability of the source code under royalty-free licenses granting generous modification and distribution rights, the cost of producing and improving software is low. Software bugs and security problems are quickly identified and remedied. Moreover, because users have access to the source code, those users can diagnose problems and customize the software to suit their particular needs.

---

[4] The profit motive is, of course, an important incentive for software development, but it is not the only one. Open source software developers often contribute to open source projects on a voluntary basis. *See* STEVEN WEBER, THE SUCCESS OF OPEN SOURCE 129-30 (2004). Some of the motivations for their contributions include improving the functioning of a product for business or personal use, enhancing programming skills,

The scope of patentable subject matter is an issue of critical importance to the future development of all software, including open source. Because open source innovation depends on sharing source code and free collaboration, open source community members do not generally seek to prohibit or control use of open source software through patents, and most open source software developers view software patents as hindering innovation. Red Hat respectfully submits that this Court should evaluate the issues at bar with a view to the importance of open source software and the bright promise of future open source innovation.

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reputation, philosophical commitment to free software, and personal enjoyment. *Id.* at 134–36. Copyright protects authors against the copying of their software. Patents, of course, block independent invention of patented technology. Although some patent advocates use the rhetoric of "theft" of ideas to support their arguments, there is evidence that the great majority of patent lawsuits are not against defendants who copied inventions but rather against independent inventors. DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 28 (2009) [hereinafter "THE PATENT CRISIS"].

SUMMARY OF ARGUMENT

This Court has long recognized that patents do not always promote innovation, and they may substantially hinder it. Thus in evaluating patent eligibility under 35 U.S.C. § 101 ("Section 101"), the Court has consistently held that certain types of abstract ideas are excluded. Two types of excluded abstract ideas are illustrated by the patent claims at issue here. The first is broadly stated economic practices prevalent in our system of commerce like the one in issue in *Bilski v. Kappos*, 130 S. Ct. 3218, 3229–31 (2010). The second is mathematical algorithms like the one found unpatentable in *Gottschalk v. Benson*, 409 U.S. 63, 68 (1972).

Software is properly understood as involving layers of abstraction. Examples of such layers include the idea of a program or its function, the methodology of how the program achieves the idea, the source code of the program (that is, the human readable computer instructions), and the object code of the program (the machine readable instructions). The claims at issue here describe a methodology for financial intermediation that is abstract in the same manner as the patent claims rejected in *Bilski*. It also effectively includes mathematical algorithms, because only through such algorithms in source and object code could the claims be implemented.

To be sure, when mathematical algorithms or other abstract ideas are augmented by an inventive concept, they may satisfy the requirements of Section 101. However, merely adding a general purpose computer to an otherwise unpatentable algorithm is far from an inventive concept. The computer adds nothing meaningful to the abstract idea, and amounts to insignificant post-solution activity. Viewing a general purpose computer as a different machine each time it runs a different program is a highly artificial, because such machines are not in any material way changed by running software.

In confirming the boundaries for software patents, it is significant that such patents were generally not issued until the mid-1990s. Between the 1940s and 1990s, without patent protection or threats, extraordinary innovation occurred, and software grew from an interesting idea into a major industry. In the early 1990s, key leaders in the software industry were opposed to software patents. However, following a series of decisions by the Federal Circuit in the mid-1990s, there was an explosion in software patenting, and now there are hundreds of thousands of such patents.

Far from encouraging innovation, this proliferation of patents has seriously encumbered it. Because software is an abstract technology, translating software functions into patent language generally results in patents with vague and uncertain boundaries. Software products are often highly complex, created by combining hundreds or thousands of discrete elements in a cumulative process.

Because the boundaries of software patents are exceedingly vague and the numbers of issued software patents is now enormous, it is virtually impossible to rule out the possibility that a new software product may arguably infringe some patent. Creating a new software product therefore always entails an unavoidable risk of a lawsuit that may cost millions of dollars in legal fees, as well as actual damages, treble damages, and an injunction that terminates a business.

This case offers an opportunity to restore the historical and well-founded boundaries for patentable subject matter that exclude abstract ideas of the type generally involved in software from patent eligibility. This course correction will both bring clarity to the law and remove a significant barrier to technology innovation.

ARGUMENT

I. THIS COURT'S DECISIONS ESTABLISH THAT THE TYPES OF ABSTRACT IDEAS THAT ARE CHARACTERISTIC OF SOFTWARE FALL OUTSIDE THE SCOPE OF SECTION 101.

This Court has long recognized that patents have costs as well as benefits. *See Benson*, 409 U.S. at 68–72 (explaining *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1853)). Patents do not always promote innovation, and they may substantially hinder it. *See id.* A patent on a process excludes others from using that process, and thus may block or discourage technological progress. Therefore, defining the proper subject matter limits under 35 U.S.C. § 101 is of critical importance.

Thus this Court has determined that "laws of nature, natural phenomena, and abstract ideas" are excluded from patent protection. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981). The Court's prior cases have established guidelines for two types of unpatentable abstract ideas that are applicable here.

The first type is a broad concept of a "practice long prevalent in our system of commerce… ." *Bilski*, 130 S. Ct. at 3231. *Bilski* rejected an attempt to patent a business method for reducing the risk of price changes for commodities in the energy market. The Court determined that "[t]he concept of hedging . . . is an unpatentable abstract idea . . . ." *Id.* Allowing such a patent "would effectively grant a monopoly over an abstract idea." *Id.*

The second type of unpatentable abstract idea is a mathematical algorithm. *Diehr*, 450 U.S. at 185. For example, in *Benson*, the patent application at issue concerned an algorithm for converting signals from binary-coded decimal numerals into pure binary form. The Court rejected the attempt to patent "the algorithm itself." 409 U.S. at 72. Similarly, in *Parker v. Flook*, 437 U.S. 584, 585–87 (1978), the Court rejected a patent application describing methods of updating alarm limits for use in the petrochemical and oil-refining industries.

Software involves several different levels of abstract ideas. At a high level there is the function of the software, or the problem that the software is designed to solve. An example is the idea for a program that creates textual documents, spreadsheets, or calendars. At another level is the general methodology for fulfilling the functions. For word processing, for example, the software may be thought of as storing in computer memory the necessary letters and symbols in various fonts, receiving signals from an input device such as a keyboard, and as a result of this input, storing the particular letters in a file in memory. This level can be expressed in mathematical terms, though it can also be described in conventional language similar to the business method claims rejected in *Bilski*.

Underneath the abstract ideas for what the software does and the general methodology is the human-readable source code, and underneath that, there is the object code that implements the program. Computer scientists view source and object code as equivalent to mathematical algorithms. Ben Klemens, *The Rise of the Information Processing Patent*, 14 B.U. J. Sci. & Tech. L. 1, 9–11 (2008); Ben Klemens, Math You Can't Use 26–44 (2006) [hereinafter "Math You Can't Use"].

As Donald E. Knuth, Professor Emeritus at Stanford University and one of the world's most respected computer scientists, has explained, "[it is not] possible to distinguish between 'numerical' and 'nonnumerical' algorithms, as if numbers were somehow different from other kinds of precise information." Letter from Donald Knuth, Professor Emeritus at Stanford Univ., to the Comm'r of Patents and Trademarks (Feb. 23, 1994), *available at* http://progfree.org/Patents/knuth-to-pto.txt; *see also Diehr*, 450 U.S. at 219 n.47 (Stevens, J., dissenting) (citing scholarly authority for the proposition that computer programs are algorithms).

The claims at issue in this case describe in high-level terms the steps involved in financial intermediation. Escrow arrangements are fairly viewed as "a fundamental economic practice." *Bilski*, 130 S. Ct. at 3231. The type of abstraction at issue is comparable to that in *Bilski*. Thus the claims here plainly fall outside the scope of Section 101.

Moreover, the claims here involve mathematical algorithms, inasmuch as implementing them would require source code and object code. That is, although the code is not described in any detail, the technology could never be used unless source code were written and compiled into object code. Source code and object code are properly understood as essentially mathematical and algorithmic in nature. Thus the invention here is also correctly viewed as the type of abstract idea found unpatentable in *Benson*. For this reason as well, the claims here fall outside the scope of Section 101.

II. AN ABSTRACT IDEA MAY BE PART OF A PATENTABLE INVENTION, BUT SUCH AN INVENTION MUST CONTAIN MORE THAN MERE POST-SOLUTION ACTIVITY TO SATISFY SECTION 101.

A. ABSTRACT IDEAS MAY BE COMBINED WITH INVENTIVE CONCEPTS AND BECOME PATENT ELIGIBLE.

Although a claim to an algorithm, law of nature, or other abstract idea by itself will not satisfy the requirements of Section 101, it may be part of a patentable invention. In other words, an application of an abstract idea may be patentable, even though the abstract idea alone is not. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293–94 (2012). There must be "elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon" the abstract idea itself. *Id.* at 1294.

This is illustrated by *Diehr*, which concerned a process for molding uncured synthetic rubber into cured precision products. 450 U.S. at 177. This process involved continuously measuring the temperature in a mold and feeding the results into a computer, which would use the Arrhenius equation to recalculate the appropriate cure time. The Court concluded that when the patent was considered as a whole, it was not an attempt to patent the Arrhenius equation, but rather a patent on an industrial process for molding rubber.

Thus *Diehr* recognized that an algorithm that is plainly unpatentable by itself may be a part of a process that is patentable when it involves a physical transformation of the sort that has traditionally been considered patentable, such as an industrial process for curing rubber. *Id.* at 184–88; *see also Flook*, 437 U.S. at 589–95. The Court has also recognized that an otherwise abstract idea may be patentable when "tied to a particular apparatus." *Flook*, 437 U.S. at 588, n.9 (citing *Cochrane v. Deener*, 94 U.S. 780, 787–88 (1876)).

B. A CLAIM ELEMENT INVOLVING ABSTRACT SOFTWARE THAT MERELY ADDS A GENERAL PURPOSE COMPUTER DOES NOT INCLUDE AN INVENTIVE CONCEPT, BUT INSTEAD INCLUDES ONLY INSIGNFICANT POST-SOLUTION ACTIVITY.

Petitioner has argued that the patent at issue here is likewise "tied to a particular apparatus," because it involves a general purpose computer. This is an argument that proves too much. If running software on a computer were sufficient to overcome the prohibition on patenting abstract ideas, all software written to run on a general purpose computer would satisfy Section 101. This result is foreclosed by *Benson*.

In *Benson*, the patent application covered "a method of programming a general-purpose digital computer to convert signals from binary-coded decimal to pure binary form." 409 U.S. at 65. The Court found that the procedure at issue was a mathematical algorithm, and amounted to an unpatentable abstract idea. *Id.* at 65–66, 71–72. The Court noted that the algorithm had "no substantial practical application except in connection with a digital computer... ." *Id.* at 71. The claims were intended to "cover any use of the claimed method in a general-purpose digital computer of any type." *Id.* at 64.

Thus the algorithm claimed in *Benson* could have been viewed as "tied to a machine," inasmuch as it was functionally tied to a digital computer. Nevertheless, the Supreme Court held that the claims were abstract ideas outside the scope of Section 101. *Benson* therefore precludes an interpretation of Section 101 that views abstract ideas as patentable based on their implementation in software running on a general purpose computer.

Diehr is consistent with this understanding. The rubber curing process in *Diehr* involved an algorithm and a computer, but the Court's analysis of subject matter turned on the claim as a whole, which concerned the physical transformation of the rubber—not the implementation of the algorithm in a computer program. 450 U.S. at 184–88. *Diehr* explained that use of the computer did not render the process unpatentable, but the decision makes clear, by its focus on the transformation of rubber, that use of the computer alone does not suffice to make the process patentable. *See id.* at 187.

The *Diehr* Court cautioned against allowing the prohibition on patenting of abstract formulas to "be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* at 191 (citing *Parker v. Flook*, 450 U.S. 584). "To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection." *Id.* at 192. In view of this caution, this Court should make clear that the test for patentable subject matter cannot be satisfied by the mere drafting device of adding components of a general purpose computer as limitations of a claim that is otherwise directed to an unpatentable algorithm.

Although computers are extraordinary machines, in the last half century they have become as fundamental and common as the telephone once was, or before that the telegraph, and countless earlier human technologies that were major advances in their time. It is clear that a general purpose computer by itself cannot amount to an "inventive concept." *See Mayo*, 132 S. Ct. at 1294. When software has been written for a general purpose computer, it is reasonable to view running that software on a computer as "insignificant post-solution activity." *Diehr*, 450 U.S. at 191.

However, some have taken the view that a general purpose computer running a software program becomes a special purpose computer. *See In re Alappat*, 33 F.3d 1526, 1545 (Fed. Cir. 1994) (en banc), *abrogated by In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008). This view is highly artificial, if not metaphysical.

Modern computers are designed to be capable of running software of varying designs and purposes. Running a program does not materially change the physical hardware. To be sure, each program has an ephemeral effect on the voltage levels that implement the ones and zeros of machine language. Viewing such an effect as creating a special purpose computer would be like saying a telephone becomes a "special purpose telephone" when used for a particular call, or a television becomes a 'special purpose television" when used to watch a particular channel or other content. In short, viewing a computer as being fundamentally transformed each time a program is run is untenable.

III. BY CORRECTING LOWER COURT CASE LAW PERMITTING WHOLESALE PATENTING OF SOFTWARE, THIS COURT WILL REMOVE A BURDEN ON INNOVATION THAT HAS CAUSED SIGNIFICANT ECONOMIC HARM.

A. SOFTWARE INNOVATION LONG PREDATED SOFTWARE PATENTS.

The importance of the software industry to the United States economy is well recognized. What is less well recognized is that major innovations and enormous economic successes in the software industry occurred without the encouragement or threat of software patents. Such extraordinarily successful software products as Microsoft Word, Oracle Database, Lotus 1-2-3, the Unix operating system, and the GNU C compiler all date from the 1980s or earlier—well before the proliferation of software patents that began in the 1990s. Market forces, rather than patents, spurred development of these products. *See* FED. TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY Ch. 3, § V(C) (2003) [hereinafter "FTC INNOVATION REPORT"], *available at* http://www.

ftc.gov/sites/default/files/documents/reports/promote-innovation-proper-balance-competition-and-patent-law-and-policy/innovationrpt.pdf; *see also* James Bessen & Robert M. Hunt, *An Empirical Look at Software Patents* 6 (Fed. Reserve Bank of Philadelphia, Working Paper No. 03-17/R, 2004) [hereinafter "*An Empirical Look*"], *available at* http://www.researchoninnovation.org/swpat.pdf.

In the 1972 *Benson* decision, this Court took note of the exclusion of software from patenting, of problems caused by attempts to patent software, and of the industry's impressive growth without patents. "Direct attempts to patent [software] programs have been rejected on the ground of nonstatutory subject matter." *Benson*, 409 U.S. at 72 (quoting THE PRESIDENT'S COMM'N ON THE PATENT SYS., TO PROMOTE THE PROGRESS OF USEFUL ARTS, S. DOC. No. 90-5, at 13 (1st Sess. 1967) [hereinafter "PRESIDENT'S COMM'N REPORT"]). "Indirect attempts to obtain patents and avoid the rejection, by drafting claims as a process, or a machine or components thereof programmed in a given manner, rather than as a program itself, have confused the issue further and should not be permitted." *Id.* (quoting PRESIDENT'S COMM'N REPORT, *supra*, at 13).

The *Benson* Court noted "that the creation of programs has undergone substantial and satisfactory growth in the absence of patent protection and that copyright protection for programs is presently available." *Id.*; *accord Diehr*, 450 U.S. at 217 (Stevens, J. dissenting) (noting commentary that the software industry "is growing by leaps and bounds without [patent protection].").

Software patent policy changed in the mid-1990s. In 1996, the Examination Guidelines for Computer-Related

Inventions changed the PTO's approach and authorized such patents. Examination Guidelines for Computer-Related Inventions, 61 Fed. Reg. 7478, 7479–92 (Feb. 28, 1996). Around this time, the Federal Circuit expanded its view of patent eligibility for software. *See An Empirical Look*, *supra*, at 3; *In re Alappat*, 33 F.3d at 1544–45; *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), ***abrogated by In re Bilski***, 545 F.3d 943 (Fed. Cir. 2008). Software patenting greatly expanded in the following years. *An Empirical Look*, *supra*, at 3, 5.

The point here is that the software industry began and reached maturity without the benefit of patent monopolies. This is not to say there was no legal protection for software products. As the *Benson* Court noted, copyright law provided (and it still provides) substantial protection for software products.[5]

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[5] Although it is frequently assumed that patents encourage technological innovation, there is little empirical evidence supporting this view. In a 2003 report entitled "Patents in the Knowledge-Based Economy," the National Research Council conducted a comprehensive review of the United States patent system, and concluded that "[t]here are theoretical as well as empirical reasons to question whether patent rights advance innovation in a substantial way in most industries." NAT'L RESEARCH COUNCIL, PATENTS IN THE KNOWLEDGE-BASED ECONOMY 2 (2003). Scholarly studies have called into question the basic assumption that patent protection in general spurs innovation. *See* Michele Boldrin & David K. Levine, *The Case Against Patents* 1 (Fed. Reserve Bank of St. Louis, Working Paper No. 2012-035A, 2012), *available at* http://research.stlouisfed.org/wp/2012/2012-035.pdf ("there is no empirical evidence that [patents] serve to increase innovation and productivity"); Andrew W. Torrance & Bill Tomlinson, *Patents and the Regress of Useful Arts*, 10 COLUM. SCI. & TECH. L. REV. 130, 133–34 (2009), *available at* http://www.stlr.org/html/volume 10/Torrance.pdf.

This recent history, by itself, calls into serious question whether software patents serve the primary purpose of the patent system of encouraging innovation. *See* U.S. CONST. art. I, § 8. Many of the world's most successful software companies and software products originated and grew strong without incentives from patents. Instead, these successes arose from the dynamics of the competitive market place. FTC INNOVATION REPORT, *supra*, at Ch. 3, § V(C). That is, prior to the expansion of patentability for software in the mid-1990s, survival in the market place for software depended primarily on the ability to innovate better and more quickly than competitors. Competition, without patent monopolies, resulted in a remarkably dynamic software industry with an impressive record of innovation.

B. THE PROLIFERATION OF SOFTWARE PATENTS HAS RESULTED IN NEW RISKS THAT DISCOURAGE INNOVATION.

Since the mid-1990s, software patents have proliferated. At present in the United States there are hundreds of thousands of issued software patents. *See* JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE 22 (2008) [hereinafter "PATENT FAILURE"]. They continue to increase at the rate of tens of thousands per year. *An Empirical Look*, *supra*, at 3. This proliferation has raised significant risks for software developers.

For years, far-sighted industry leaders, scholars, and software developers have warned of these risks and opposed software patents. PATENT FAILURE, *supra*, at 189. These include Bill Gates, co-founder of Microsoft. In 1991, Mr. Gates, stated, "If people had understood how patents would be granted when most of today's ideas were invented, and had taken out patents, the industry would be at a complete standstill today. . . ." Kirk D. Rowe, *Why Pay for What's Free?: Minimizing the Patent Threat to Free and Open Source Software*, 7 J. MARSHALL REV. INTELL. PROP. L. 595, 595 (2008).[6]

Similarly, Professor Knuth, of Stanford University, wrote in 1994, "When I think of the computer programs I require daily to get my own work done, I cannot help but realize that none of them would exist today if software patents had been prevalent in the 1960s and 1970s." Letter from Donald Knuth to the Comm'r of Patents and Trademarks, *supra*. Dr. Knuth also stated, "I strongly believe that the recent trend to patenting algorithms is of benefit only to a very small number of attorneys and inventors, while it is seriously harmful to the vast majority of people who want to do useful things with computers." *Id.*

The views of Mr. Gates and Professor Knuth were shared by many firms and developers in the 1990s. *See* PATENT FAILURE, *supra*, at 189. The risk that they articulated—that patents tend to hinder software innovation—relates to at least two different aspects of software: the incremental nature of software development and the near impossibility of establishing clear boundaries for software patents.

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[6] Adobe and Oracle likewise opposed software patents in 1994. *See* Public Hearing on the Use of the Patent System to Protect Software-Related Inventions Before the U.S. Patent & Trademark Office 16–18 (1994) (statement of Douglas Brotz, Principal Scientist, Adobe Systems, Incorporated), *available at* http://www.uspto.gov/web/offices/com/hearings/software/sanjose/sjhrng.html; *id. at* 23–25 (statement of Jerry Baker, Senior Vice President, Oracle Corporation).

In general, software innovation is cumulative in nature—that is, new products typically build on products built previously. *See* FTC INNOVATION REPORT, *supra*, at Ch. 3, § V(B); THE PATENT CRISIS, *supra*, at 47. Innovation is rapid and product cycles are short. Major software products are complex, involving many thousands or even millions of lines of code and many different components. Components are normally developed using many earlier-developed sub-components. Some software products contain thousands of distinguishable components, any number of which could (in view of erroneous patenting practices) already be patented. *See* FTC INNOVATION REPORT, *supra*, at Ch. 3, § V(E)(2)(c); THE PATENT CRISIS, *supra*, at 53–54.

It is, however, practically impossible to know with reasonable certainty whether a new software product could be said to infringe some prior software patent. Patents are conventionally referred to as intellectual property. However, as James Bessen and Michael Meurer have explained in detail, patents differ substantially from tangible property in that their boundaries are often fuzzy and unpredictable. PATENT FAILURE, *supra*, at 46–72. If patents do not give clear notice of their limits, they create a risk of inadvertent infringement. Vague patents also enable opportunistic behavior. For example, a patentee may, based on vague language, claim ownership of a technology unknown to the inventor, but instead first conceived by someone else.[7] *Id.* at 199.

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[7] The unreliability of indexing for software patents also means that software patents are of little use in advancing

This problem of uncertain patent boundaries is particularly acute with software patents. As discussed in Section I, software is an abstract technology, with various levels of abstraction. Software algorithms can be represented in numerous different ways, and even computer scientists sometimes disagree over whether two software technologies are equivalent. *See* PATENT FAILURE, *supra*, at 22, 203. Thus it is not surprising that software patents are typically framed in abstract language with uncertain boundaries. *See id.* at 22–23, 203; THE PATENT CRISIS, *supra*, at 27, 58. As a result, a software developer, when shown a software patent, often cannot be sure whether the patent reads on newly developed code. *See* FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE 80–83 (2011) [hereinafter "FTC IP MARKETPLACE REPORT"], *available at* http://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/110307patentreport.pdf.

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innovation by disclosing new technology. From a software developer's point of view, it is completely impractical to seek new ideas in patents, and few if any do so. Most avoid reading patents, for fear that a chance encounter may increase the risk that they will one day be accused of willful infringement. *See* THE PATENT CRISIS, at 32; Mark A. Lemley, *Ignoring Patents*, 2008 MICH. ST. L. REV. 19, 21–22 (2008). A further indication of the ineffectiveness of the patent system for software is that there is little patent licensing prior to development and distribution of products. *See* THE PATENT CRISIS, *supra*, at 59. Because of vague patent boundaries and unreliable search methods, it is not possible to determine all possible rights at issue and strike bargains as to those rights.

This difficulty is multiplied hundreds or thousands of times with regard to a complex software product combining hundreds or thousands of discrete components. A separate but related problem faces all software developers—that of the impossibility of patent clearance, or determining whether there are existing patents that may be said to read on a new product. There is no reliable, economical method for searching the hundreds of thousands of existing software patents. *See* PATENT FAILURE, *supra*, at 50, 69–70; *see also* Christina Mulligan & Timothy B. Lee, *Scaling the Patent System*, 68 N.Y.U. ANN. SURV. AM. L. 289, 289, 297–305 (2012); FTC IP MARKETPLACE REPORT, *supra*, at 90–91; Klemens, *supra*, at 79–80. The clearance problem is made even worse by the existence of tens of thousands of applications that, for eighteen months after filing, are unpublished.

Thus, simply by virtue of producing and marketing an innovative software product, a software developer assumes the risk of a costly patent infringement lawsuit. *See* FTC INNOVATION REPORT, *supra*, at Ch. 3, § V(E). In the U.S., software patents are more than twice as likely to be the subject of a lawsuit than other patents and account for one quarter of all patent lawsuits. PATENT FAILURE, *supra*, at 22, 192. The cost of defending a patent lawsuit frequently amounts to several million dollars. AM. INTELL. PROP. L. ASS'N, REPORT OF THE ECONOMIC SURVEY 35, I-145–46 (2013). Such lawsuits involve technical issues that are difficult for judges and juries to understand, and so even with a strong defense the outcome is usually far from certain. If there is a judgment of infringement, the penalty may be an injunction ending further production and enormous monetary damages. Defense costs and litigation risks are so large that in most cases defendants agree to some payment to settle such cases. Even when claims appear to have no valid basis, targets frequently agree to pay for licenses based on the mere threat of litigation. Michael J. Meurer, *Controlling Opportunistic and Anti-Competitive Intellectual Property Litigation*, 44 B.C. L. REV. 509, 513–15 (2003).

Some large technology companies have addressed the risk of inadvertent infringement of patents by seeking as many patents as possible, on the theory that a large patent portfolio signals the possibility of a countersuit and thus will deter other companies from bringing a patent lawsuit.[8] *See* FTC INNOVATION REPORT, *supra*, at Ch. 2, § (III)(C)(2)(b); THE PATENT CRISIS, *supra*, at 55. Companies with such portfolios often enter into cross-licensing agreements with other large companies that have their own patent portfolios in an attempt to obtain a modicum of patent peace. FTC INNOVATION REPORT, *supra*, at Ch. 3, § V(E)(2)(c)(i); *see also* Richard M. Stallman, Speech at the University of Cambridge, London (Mar. 25, 2002), *in* FREE SOFTWARE, FREE SOCIETY: SELECTED ESSAYS OF RICHARD M. STALLMAN 97, 103–04 (2002); MATH YOU CAN'T USE, *supra*, at 83–85.

While such defensive measures are understandable from an individual enterprise's perspective, they are far from optimal. They create a vicious cycle: to defend against a multitude of vague patents, companies obtain still more vague patents. Resources expended on this strategy are, of course, unavailable for research and development or for other more productive purposes. FTC INNOVATION REPORT, *supra*, at Ch. 3, § V(E)(2)(c). Moreover, although established companies may be able to bear the cost of this deterrence strategy, small companies and potential new competitors generally lack the resources to do so. Thus the system discourages new entry into the market, and thereby hinders innovation. *See id.*; *see also* CLAYTON M. CHRISTENSEN, THE INNOVATOR'S DILEMMA 9, 52 (2002) (showing that small firms generally lead in new technologies).

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[8] Red Hat, like some of its competitors, has built a patent portfolio. This portfolio is designed to be used only for the purpose of defending against patent aggression. Red Hat has extended a public Patent Promise under which it pledges not to enforce its patents against parties that infringe those patents through their use of software covered by designated open source licenses. *See* https://www.redhat.com/legal/patent_policy.html.

Moreover, even for companies with the financial resources to build patent portfolios, the deterrence approach is not always effective. With the proliferation of software patents has come the expansion of a class of businesses created expressly for the purpose of exploiting vague patents. *See* FTC IP MARKETPLACE REPORT, *supra*, at 60–62; Klemens, *supra*, at 27–31 (2008); Meurer, *supra*, at 509.

These are sometimes referred to as non-practicing entities ("NPEs"), patent assertion entities ("PAEs") or, less politely, as patent trolls. These entities acquire vague patents at low cost with a view to threatening or bringing lawsuits against operating businesses. They frequently conceal their identities and holdings until the companies that are their targets, which have no knowledge of the relevant patents, are locked in to a product and business strategy. Then they demand ransom. Because such entities produce no products, they are not deterred by the possibility of a countersuit.

NPE lawsuits have greatly increased in frequency in recent years and now account for more than 60 percent of all U.S. patent litigation. James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes* 4 (Boston Univ. Sch. of Law, Working Paper No. 12-34, 2012), *available at* http://www.bu.edu/law/faculty/scholarship/workingpapers/2012.html; Colleen V. Chien, *Patent Trolls by the Numbers*, (Santa Clara Univ. Sch. of Law Research Paper No. 08-13, 2013), *available at* http://ssrn.com/abstract=2233041. NPE lawsuits are concentrated in the technology sector, and between 62 and 94 percent involve software patents. Bessen & Meurer, *supra*, at 7. Professors Bessen and Meurer have calculated the direct costs of NPE assertions in just one year (2011) at $29 billion. *Id.* at 2. They point out that much of this amount is social loss, and amounts to a tax on innovation. *Id.* at 5.

Recently a hybrid type of NPE has emerged which is sometimes referred to as a patent privateer. Operating companies that might otherwise be deterred from suing a competitor by the threat of a patent countersuit instead recruit an NPE to bring suit. The resulting lawsuit may cost the target company millions to defend, as well as distracting it from innovating and other business activities. *See* Edith Ramirez, Chairwoman, Fed. Trade Comm'n, Opening Remarks at the Computer & Communications Industry Association and American Antitrust Institute Program (June 20, 2013), *available at* http://www.ftc.gov/sites/default/files/documents/public_statements/competition-law-patent-assertion-entities-what-antitrust-enforcers-can-do/130620paespeech.pdf; Michael A. Carrier, *Patent Assertion Entities: Six Actions the Antitrust Agencies Can Take*, 1 CPI ANTITRUST CHRON. 2, 4 (2013), *available at* http://ssrn.com/abstract=2209521.

In sum, all software companies, developers, and users face substantial risks from software patents. These risks include whether an unknown patent may cover a newly written code or some other preexisting code in a complex product, whether such a patent could be the basis of a lawsuit, whether a relevant patent is in the hands of an aggressive party dedicated to bringing patent lawsuits, and whether a trial may result in an injunction or damages award.

These risks have obviously not brought the software industry to a standstill. But scholars have found that they reduce research and development and reduce entrances of competitors into the market. *See An Empirical Look*, *supra*, at 38–39; Iain M. Cockburn & Megan J. MacGarvie, *Entry and Patenting in the Software Industry* 21 (Nat'l Bureau of Econ. Research, Working Paper No. 12563, 2006), *available at* http://www.nber.org/papers/w12563.pdf. This evidence that software patents are hindering, rather than promoting innovation and growth is a strong signal that the patent law requires a course correction.

To be sure, correcting the patent law to apply this Court's precedents to software patents will disadvantage those who currently profit from such patents, such as NPEs, companies with software patent licensing programs, and some lawyers. But a large share of existing software patents sit in large firms' portfolios and have little economic effect other than (at times) deterring competitor's patent lawsuits.[9] Invalidating these defensive patents will accord with the original aim of those portfolios of lessening litigation risk. Moreover, this Court's precedents have provided ample foreshadowing of the statutory problem with such patents. Any temporary costs should be more than counterbalanced by the increased economic benefits created by removing a major hindrance to software innovation.

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[9] One study found that "[t]wo-thirds of all software patents are obtained by a small group of industries known for strategic patenting," and that this group "appears to have substituted these patents for R&D." *An Empirical Look*, *supra*, at 38.

CONCLUSION

The decision of the court of appeals should be confirmed.

Respectfully submitted,

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Supreme Court of the United States

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ALICE CORPORATION PTY., LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, *et al.*,

Respondents.

◆

On Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

◆

AMICUS CURIAE BRIEF OF RETAILERS IN SUPPORT OF NEITHER PARTY

◆

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INTEREST OF *AMICI CURIAE*

Amici Curiae Balsam Hill LLC; Chico's FAS, Inc.; Crutchfield Corporation; Dillard's, Inc.; Express, Inc.; Food Marketing Institute; Hasbro, Inc.; JAND, Inc. d/b/a Warby Parker; J. Crew Group, Inc.; Jill Acquisition LLC; L Brands, Inc.; L. L. Bean, Inc.; Macy's, Inc.; Main Sequence Technology, Inc.; National Restaurant Association; Newegg, Inc.; Overstock.com, Inc.; Parke-Bell Ltd. Inc. d/b/a Touch of Class Catalog; Presidio International, Inc. d/b/a A/X Armani Exchange; QVC, Inc.; Retail Litigation Center, Inc.; SkyMall, Inc.; and The Talbots, Inc. (collectively, the "Retailers") submit this brief in support of neither party.[1]

The Retailers do not seek to pick a winner or loser in this litigation, but rather to urge the Court to adopt a threshold test for patentability under 35 U.S.C. § 101, namely, that computer-implementation cannot create patentable subject matter. The Retailers' interest is in an early resolution of the gateway issue of subject matter eligibility because the alternative – lengthy and expensive discovery, invalidity and infringement analysis, claim construction, trial, and appeal before patentability can be resolved finally by a fractured Federal Circuit – virtually guarantees that most companies will accept a cost-of-litigation settlement rather than find out whether the alleged invention is actually patentable. As a practical matter, delaying a decision on this dispositive issue until at or after trial means that the most basic question of all – does this invention qualify for patent protection? – will rarely, if ever, get answered.

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[1] In accordance with S. Ct. R. 37.3(a), all parties have consented to the filing of this brief. The Petitioner and Respondents have filed consent letters with the Clerk. Pursuant to S. Ct. R. 37.6, counsel for *Amici* state that no counsel for a party authored this brief in whole or in part, and no person or entity other than *Amici* or their counsel made a monetary contribution to the preparation or submission of this brief.

The Retailers have numerous differences among them. Some of them have only an online presence, while others also have brick-and-mortar stores. Some of them began as catalog sellers, while others began in a storefront. Some of them are located in a handful of locations, while others are organizations that represent tens of thousands of retailers, restaurants, retail food stores, and pharmacies located in every corner of the country. Some of them began many years ago, while others grew up with the Internet. Some of them are start-ups, while others are household names. They have their headquarters from Maine to California. They sell a vast array of products and services – from food to electronics to home furnishings to fashion wear – that cost from less than a dollar to many thousands of dollars.

What the Retailers have in common is simple – they have websites and mobile applications through which people can purchase, browse, or order their different products, offerings, or services. And, because they have websites and mobile applications, they have been sued, repeatedly, for patent infringement in cases in which a plaintiff claims that some feature of their website or mobile application infringes a computer-implemented patent, and the plaintiff seeks a percentage of their online revenues, which can amount to millions of dollars. The Retailers regularly defend lawsuits brought under patents asserted against their use online of computerized retailing cornerstones that have been around for ages – *e.g.*, the display of catalog-style images and text *on a web page*, the ability to order food *on a computer*, or the ability to flip back to previously viewed product pages *on a website*, and the like – without any regard to the myriad of ways in which those ideas are actually implemented or the details that differentiate one website from another.

Faced with a lawsuit, usually filed in a distant jurisdiction, that will certainly cost hundreds of thousands, if not millions of dollars to litigate to a conclusion years later, and faced with patent jurisprudence that is anything but certain, the Retailers must make a decision whether to litigate or settle without being able to determine whether or not the alleged invention is even patentable until all appeals have been exhausted. The Retailers' interest in this case is, as a result, intensely practical. They seek a bright-line rule of law concerning patentability that can be applied at the outset of litigation, and thus comports with this Court's direction that courts address subject matter eligibility as a "threshold" issue. *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010). Such a rule would yield quicker, better, and less expensive outcomes.

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SUMMARY OF ARGUMENT

The Retailers seek a clear rule of law concerning patentability that can be applied at the beginning of a lawsuit. Whether or not a claimed invention is patentable under 35 U.S.C. § 101 should be a threshold issue that can be addressed in many, if not most, cases on a motion to dismiss at the start of the litigation. This not only follows as a straight line from this Court's recent patent decisions, but is necessary to fulfill the mandate of Section 101, which, after all, is entitled "Inventions Patentable." It makes no sense to answer the complicated and costly questions whether a patent is infringed or is anticipated or obvious in light of some prior art, or anything else, if the underlying invention is not even patentable. It would be like being forced by the DMV to pay for expensive repairs on a used car in order to obtain a new inspection sticker only to be told after the car passes inspection that the person who sold you the car never had title to it in the first place.

Furthermore, the threshold test to the question presented to this Court should be that computer-implementation cannot create patentable subject matter. Just as a putative inventor cannot simply recite a law of nature and then add the instruction "apply the law," *Mayo Collaborative Servs. v. Prometheus Labs.*, *Inc.*, 132 S. Ct. 1289, 1297 (2012), a putative inventor cannot simply recite an abstract idea or general idea and then add the instruction "apply it on a computer." Computer-implementation, alone, cannot create patentable subject matter.

Currently, there is not a single rule of law that can be applied either at the outset or the conclusion of litigation to address this issue. The splintered six opinions spanning over 125 pages from the *en banc* Federal Circuit, none of which represents the opinion of a majority of that court, means that no one can be certain what is patentable until they learn the make-up of their panel on appeal.

This lack of certainty has serious, real-world consequences. Computer-implemented patents are among the fastest growing category of patents, the patents most likely to be litigated, and the patents least likely to be found valid and infringed if litigated to the bitter end. Further, they are more likely than others to be asserted against companies that merely use the accused software, such as retailers who sell goods over the Internet, and not the companies that wrote the accused source code. Because of the cost of reaching the bitter end, in which non-infringement and invalidity will only be determined finally after defendants will have expended enormous, usually unrecoverable, sums, computer-implemented patents are also among the patents least likely to be litigated to a final judgment, particularly by companies that use, but did not create, the accused technology. So long as the plaintiff prices a settlement below the enormous costs of full-blown litigation, which is the norm in this arena, most defendants will opt for a cost-of-litigation settlement instead of litigating the patentability of even the gauziest of patents. Thus, even if a panel of academics could agree on a definition of patentability, if it is not expressed in a clear legal rule that can be applied at the beginning of the litigation by a district court judge, it will remain academic for most defendants.

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ARGUMENT

I. THE COURT SHOULD ADOPT A THRESHOLD TEST THAT COMPUTER-IMPLEMENTATION CANNOT CREATE PATENTABILITY UNDER SECTION 101.

A. The Court Should Reaffirm That Patentability Under Section 101 Is A Threshold Test.

"[N]o patent is available for a discovery, however useful, novel, and nonobvious, unless it falls within one of the express categories of patentable subject matter." *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 483 (1974) (brackets added). Title 35 U.S.C. § 101, entitled "Inventions Patentable," sets forth the metes and bounds of what is patentable, and what is not.

The initial question is whether Section 101 is a threshold test, or not. Although this issue sharply divides the Federal Circuit and lower courts, *see*

David Swetnam-Burland & Stacy O. Stitham, *Patent Law 101: The Threshold Test As Threshing Machine*, 21 Tex. Intell. Prop. L.J. 135 (2013), it does not divide this Court.

In *Bilski v. Kappos*, 130 S. Ct. 3218 (2010), the Court held that "[t]he § 101 patent-eligibility inquiry is only a threshold test." *Id.* at 3225 (brackets added). Although Justice Stevens and the other concurring Justices disagreed on the proper standard to conclude likewise that Bilski's claimed invention was not patentable, on the role of Section 101, there was no daylight between the majority and concurrence: "Section 101 imposes a threshold condition." *Id.* at 3236 (Stevens, J., concurring in the judgment).

In *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012), the Court unanimously found that Prometheus' striving for a patent came up short because it was attempting to claim a law of nature, which is an implicit exclusion from patentability under Section 101:

> The Court has long held that this provision contains an important implicit exception. "[L]aws of nature, natural phenomena, and abstract ideas" are not patentable.

Id. at 1293 (brackets added by Court and quoting *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (other citations omitted).

Significantly, for present purposes, the Court rejected the Government's *amicus curiae* argument that other provisions of the Patent Act governing novelty, obviousness, and written description (35 U.S.C. §§ 102, 103, 112) can better perform the "screening function" than 35 U.S.C. § 101. *See Mayo*, 132 S. Ct. at 1303. "This approach, however, would make the 'law of nature' exception to § 101 patentability a dead letter." *Mayo*, 132 S. Ct. at 1303. "And to shift the patent-eligibility inquiry entirely to these later sections risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do." *Id.* at 1304. In other words, the unanimous Court reaffirmed in *Mayo* that Section 101 should continue to perform its unique and uniquely important "screening function" as a "threshold test."

Just as subject matter jurisdiction is a threshold issue that may be more difficult to decide than other issues in a lawsuit, but nevertheless should be decided before turning to the merits of the lawsuit precisely because it is a threshold issue, *see Steel Co. v. Citizens for a Better Environment*, 523 U.S. 98 (1998), patentability should be decided at the outset of the litigation before turning to issues that are specific to the patent-in-suit. Although motions to dismiss under Section 101 certainly will not dispose of all meritless patent lawsuits, that is not a reason to deny Section 101 its role as a threshold test, any more than the inability of motions to dismiss to weed out all meritless lawsuits would be a reason to eliminate Federal Rule of Civil Procedure Rule 12(b)(6).

For the Retailers, treating patentability as a threshold test subject to a motion to dismiss, instead of just another validity defense to be resolved eventually, is not a distinction without a difference. Patentability under Section 101 is a doctrine that is different in kind from anticipation, obviousness, and the other invalidity defenses found in Sections 102, 103, and 112. While those doctrines assess the validity of a claim against specific prior art references or standards of adequacy of the patent's specification, Section 101 asks a court to police the boundaries of what can and cannot be patented, a different enterprise with a different set of aims. If the former sections tell us whether a patentee played the game by the rules, the latter section tells us whether he or she was playing the game at all.

The practical consequence is that anticipation, obviousness, and the other invalidity defenses found in Sections 102, 103, and 112 generally require extensive, expensive, discovery, prior art searching, invalidity analysis, claim construction, expert reports and depositions, and the other accoutrements of patent litigation before the district court can address them, either on summary judgment or at trial. In contrast, patentability under Section 101 can – and should – be addressed as a legal issue at the outset of the lawsuit on a motion to dismiss. Given the practical problems discussed below that the Retailers and others face in litigating patent cases to a final judgment, treating patentability as a threshold issue or not will largely determine in almost every case whether patentability is ever addressed by a court.

B. The Court Should Hold That Computer-Implementation Cannot Create Patentability.

Abstract ideas cannot be patented, no matter how novel and useful. *Diehr*, 450 U.S. at 185. Furthermore, since at least 1978, the Court has made clear that "the prohibition against patenting abstract ideas 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment' or adding 'insignificant postsolution activity.'" *Bilski*, 130 S. Ct. at 3230 (quoting *Diehr*, 450 U.S. at 191-92, and citing *Parker v. Flook*, 437 U.S. 584 (1978)).

"*Flook* rejected '[t]he notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process.'" *Bilski*, 130 S. Ct. at 3230 (brackets added by Court and quoting *Flook*, 437 U.S. at 590). Applying *Flook*, the Court recently concluded that "[p]urely 'conventional or obvious' '[pre]-solution activity' is normally not sufficient to transform an unpatentable law of nature into a patent-eligible application of such a law." *Mayo*, 132 S. Ct. at 1298 (brackets added by Court and citations omitted). Thus, "[a] patent . . . could not simply recite a law of nature and then add the instruction 'apply the law.'" *Id*. at 1297 (ellipsis and brackets added).

So, too, here. A patent cannot simply recite a general concept or abstract idea, and then add the instruction "apply using a computer" or "apply it on the Internet." Plaintiffs have repeatedly filed suits, and obtained significant settlements, based on patents asserted against computerized versions of concepts that have been around for ages, such as the ability to interact with a live customer service representative *over the Internet*, or the ability to calculate nutritional information *on a website*, and the like, regardless of the manner in which those concepts are actually implemented on the Internet or computer. In each of these examples, the patentee has taken a general retailing concept and simply added a "conventional or obvious" activity once the Retailers had e-commerce websites, namely, "apply using a computer" or "apply it on the Internet."

Computer-implementation should bear on the patent eligibility question only if it contributes meaningfully to narrow the scope of the claimed invention to a single, concrete application of an abstract idea for a novel and specific purpose, in the same manner in which a mathematical formula can be used narrowly to define a novel and specific industrial process new to the field. *See Diehr*, 450 U.S. at 192-93. Computer-implementation alone is not enough. The easily applied rule, therefore, that the Retailers derive from *Flook*, *Diehr*, *Bilksi*, and *Mayo* is that computer-implementation alone cannot create patentability under Section 101.

II. PRACTICAL CONSIDERATIONS OFTEN PREVENT RETAILERS FROM LITIGATING EVEN WEAK COMPUTER-IMPLEMENTED PATENTS.

The Retailers, like most pragmatic business enterprises, do not savor time spent on the finer points of patent doctrine. They feel the urgency for a clear rule of patent eligibility in the field of computer-implemented patents because that issue directly impacts their businesses on a daily basis. The sense of urgency is real because there is a significant and accelerating problem of weak computer-implemented patents being used to extract enormous unearned sums from retailers and other businesses.

To summarize, empirical studies demonstrate that a confluence of factors – the generally low quality of computer-implemented patents, the uncertainty of patent litigation outcomes, and the rising costs of patent infringement litigation – have combined to create an untenable situation. Computer-implemented patents are *more* likely to be litigated yet *less* likely to be valid. At the same time, lawsuits under computer-implemented patents are the *least* likely to reach claim construction, let alone judgment on the merits. In other words, external factors, chiefly expense and uncertainty, are leading companies to settle the very cases that the merits suggest they ought to defend most vigorously.

A 2008 estimate put the number of software patents at over 200,000. *See* James Bessen & Michael

J. Meurer, *Patent Failure* 22 (2008). Of these, some 11,000 covered some aspect of the Internet. *Id.* at 8-9. Since that time, the number of software patents has increased dramatically. James Bessen, *A Generation of Software Patents*, 18 B.U.J. Sci. & Tech. L. 241, 252-53 & Fig. 1 (2012). The Government Accountability Office recently estimated that as of 2011, patents related to software made up more than half of all issued patents. U.S. Government Accountability Office, Report to Congressional Committees, *Intellectual Property: Assessing Factors That Affect Patent Infringement Litigation Could Help Improve Patent Quality*, GAO-13-465 at 13 (Aug. 2013) ("GAO Report").

Data on litigation outcomes suggest that computer-implemented patents are of lower quality compared with patents in other fields. *See* John R. Allison, Mark A. Lemley & Joshua Walker, *Patent Quality and Settlement Among Repeat Patent Litigants*, 99 Geo. L.J. 677, 680 (2011) (software patent-owners overall win only 12.9% of their cases.). Even so, Internet patents in particular are between 7.5 and 9.5 times *more* likely to be litigated than patents in other fields. John R. Allison, Emerson H. Tiller & Samantha Zyontz, *Patent Litigation and the Internet*, 2012 Stan. Tech. L. Rev. 1, 6 (Feb. 14, 2012). Ironically, the very weakness of computer-implemented patents actually makes it more likely that they will be litigated aggressively by plaintiffs because aggressive litigation increases the odds that other potential defendants, concerned about the cost of such potential litigation, will agree to take a cost-of-litigation settlement. Erik Hovenkamp, *Predatory Patent Litigation*, 1-5 (Aug. 5, 2013) (available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2308115). Thus, the patents most likely to be litigated are the least likely to survive battle-testing.

It may be an understatement to say that the growth of patent infringement litigation generally, and in the technology sector in particular, has been explosive. *See* Bessen, *supra*, at 259 ("Clearly, the number of software patent lawsuits has continued to grow rapidly, meaning that the risk of litigation from software patents has necessarily increased."). Measured by total number of defendants – which provides a more accurate measure than the total number of cases, given the presence of large multi-defendant patent infringement litigation in some districts – the total number of patent infringement defendants increased six-fold between 1990 and 2010. Kyle Jensen, Patently-O, *Counting Defendants in Patent Litigation* (available at http://www.patentlyo.com/patent/2010/10/guest-post-counting-defendants-in-patent-litigation.html). Growth in the litigation of software patents has kept, if not exceeded, this pace. *See* Bessen, *supra*, at 259 (measuring rapid growth of software litigation by number of lawsuits); GAO Report (number of overall defendants in patent infringement lawsuits increased approximately 129% from 2007 to 2011; 89% of which was due to lawsuits involving software-related patents).

One driver of this growth is the rapid increase in litigation by "patent assertion entities," which are also known as "non-practicing entities" or "patent trolls." Given that the business of the patent assertion entity depends upon asserting patents in litigation, it is little wonder that the growth of this industry would increase the volume of patent infringement litigation. In a recent study, researchers concluded that plaintiffs whose business is to extract money from patents through litigation and licensing, as opposed to developing products under those patents, accounted for 40% of all patent cases filed in 2011, up from the already significant figure of 22% in 2007. *See* Sara Jeruss, Robin Feldman & Joshua Walker, *The America Invents Act 500: Effects of Patent Monetization Entities on US Litigation*, at 5 & 43-57, Duke Law & Tech. Review (2012); *see also* James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, at 2, Boston Univ. School of Law Working Paper No. 12-34 (June 28, 2012) (available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2091210) (patent assertion entity litigation affected 5,842 defendants in 2011, and cost the country $29 billion). Professor Colleen Chien, who has conducted several studies of patent assertion entity litigation, estimates that 62% of patent lawsuits in 2012 were brought by patent assertion entities, up from 45% in 2011. Colleen Chien, Patently-O, *Patent Trolls by the Numbers* (Mar. 14, 2013) (available at http://www.patentlyo.com/patent/2013/03/chien-patent-trolls.html).

The number of companies, organizations, and persons threatened with patent litigation by non-practicing entities is even more dramatic. Conservatively, at least 60,000 companies, organizations, and persons have been threatened with suit by such entities, and the more likely number is over 100,000. *See* Executive Office of the President, *Patent Assertion and U.S. Innovation*, at 6 (June 2013).

The explosive growth of patent litigation concerning weak computer-implemented patents by patent assertion entities would not be a crisis if there was a quick, inexpensive way to separate the wheat from the chaff. But that is not the reality of modern patent litigation.

It belabors the obvious to state that patent litigation is breathtakingly expensive. The American Intellectual Property Law Association estimates that the average cost of patent litigation ranges from a low of $350,000 to reach the end of discovery and $650,000 to fully complete litigation when less than $1,000,000 is at risk, to a high of $3,000,000 to reach the end of discovery and $5,000,000 to fully complete litigation when more than $25,000,000 is at risk. Am. Intell. Prop. Ass'n, *Report of the Economic Survey* (2011). Since plaintiffs frequently seek a percentage of a company's online revenues as damages for implementation of the alleged invention on the company's website, the amount at stake often reaches the high end of these estimates, and thus the projected cost of pursuing patent litigation through the final reel is likely to meet or exceed the $5,000,000 estimate. Also, given the asymmetry between parties in which plaintiffs are frequently patent assertion entities, and therefore have little discovery to provide, these costs are usually borne largely by defendants. Furthermore, these litigation costs continue to increase. *See* Stijepko Tokic, *The Role of Consumers in Deterring Settlement Agreements Based on Invalid Patents: the Case of Non-Practicing Entities*, 2012 Stan. Tech. L. Rev. 2, 8 (Jan. 9, 2012).

Absent a threshold test enabling defendants to short-circuit a patent case where the alleged invention is not patentable, defendants usually must conduct extensive analysis and provide substantial discovery before seeking a determination that they do not infringe the patent or that the patent is invalid. Both infringement under Section 271 and invalidity under Sections 102, 103, and 112 generally require detailed analysis of the patent-in-suit, usually following claim construction and expert discovery, either on summary judgment or at trial, and further require comparison of the claims as construed by the court against the defendant's specific actions or the specific pieces of prior art unearthed by the defendant. All of these requirements take time and money.

Currently, 26 districts, including some of the districts with the heaviest patent caseloads, have local patent rules. *Local Patent Rules: Patent Rules Made Easy* (available at http://www.localpatentrules.com/). These local patent rules generally frontload requirements relating to infringement and invalidity analysis, which often require defendants to produce both their non-infringement and invalidity analyses shortly after the plaintiff presents them with its infringement contentions.

The burden here falls more heavily on defendants. To prepare infringement contentions, plaintiffs must only match up the claim language of their patents against the defendants' accused functionality, by, for example, placing claim language next to screenshots of the defendants' public website – a task that they presumably already performed as part of their pre-filing investigation. To prepare invalidity contentions, defendants, by contrast, must conduct a thorough worldwide search of existing patents and patent applications, technical journals, and other written works, for specific pieces of prior art that match the claim language of the asserted patent point-for-point, and they must perform this search on the tight timeline set by the rules.

For example, Local Patent Rule 3.2 in the Northern District of Illinois requires a defendant's non-infringement, unenforceability, and invalidity contentions within 14 days after getting the plaintiff's infringement contentions. Additionally, Local Patent Rule 3.1 in the Northern District of Illinois requires defendants to provide along with their initial disclosures:

> (1) documents sufficient to show the operation and construction of all aspects or elements of each accused apparatus, product, device, component, process, method or other instrumentality identified with specificity in

> the pleading of the party asserting patent infringement; and
>
> (2) a copy of each item of prior art of which the party is aware that allegedly anticipates each asserted patent and its related claims or renders them obvious or, if a copy is unavailable, a description sufficient to identify the prior art and its relevant details.

The Local Patent Rules elsewhere generally require defendants to conduct a comprehensive search for prior art early in the litigation, and to disclose under pain of forfeiture shortly after learning the plaintiff's theory of infringement all of the defendant's specific theories of invalidity. *See*, *e.g.*, E.D. Tex. Local Patent Rule 3-3 (disclosure of invalidity theories within 45 days of receipt of infringement contentions); N.D. Cal. Local Patent Rule 3-3 (same); S.D.N.Y. Local Patent Rule 7 (same); D.N.J. Local Patent Rules 3.2A, 3.3 (disclosure of non-infringement and invalidity theories within 45 days of receipt of infringement contentions).

Additionally, in the busiest patent district, the Eastern District of Texas, standing discovery orders generally require parties at the outset of the case, without the necessity of a document request, to "produce or permit the inspection of all documents, electronically stored information, and tangible things in the possession, custody, or control of the party that are relevant to the pleaded claims or defenses involved in this action[.]" Judge Rodney Gilstrap, *Discovery Order – Patent* (brackets added) (available at http://www.txed.uscourts.gov/page1.shtml?location=info:judge&judge=17). Thus, defendants frequently must provide not only a complete accounting of their invalidity positions and prior art, but also a complete document production on a compressed schedule. Again, plaintiffs do not share this burden as their document production, particularly in the case of patent assertion entities, generally amounts to little more than a copy of the patent and its file history and records of prior settlement agreements.

Accordingly, Retailers and others sued for patent infringement incur early in the case the disproportionate costs necessary to develop their non-infringement and invalidity positions (including scouring the world for potential invalidating prior art), and to produce all potentially relevant documents, including all electronically stored information, which, in turn, necessitates significant internal investment and distraction for the Retailers and others. But, even if they incur such costs and distraction, there is no obvious exit ramp from the litigation other than settlement because infringement analysis under Section 271 and invalidity analysis under Sections 102, 103, and 112 frequently must await claim construction before being ripe for summary judgment. "[I]n almost every patent case claim construction is a dispositive issue." David L. Schwartz, *Courting Specialization: An Empirical Study of Claim Construction Comparing Patent Litigation Before Federal District Courts and the International Trade Commission*, 50 Wm. & Mary L. Rev. 1699, 1708 (2009) (brackets added). This means, however, that Retailers usually must incur the cost and distraction of a patent case through discovery and claim construction before they even have the opportunity to convince the court that they do not infringe the specific claims of the patent or that the specific claims of the patent are invalid.

Although claim construction may be a dispositive issue, it rarely is a settled issue. Studies show that the reversal rate by the Federal Circuit on claim construction ranges between 33% and 44%. Ted L. Field, *"Judicial Hyperactivity" in the Federal Circuit: an Empirical Study*, 46 U.S.F. L. Rev. 721, 734-35 & Table 1 (2012). This means that even if a Retailer is prepared to pursue the matter through trial, its odds on appeal on the dispositive issue in the litigation are little better than the flip of a coin.

Judge Young of the District of Massachusetts put the conundrum facing the litigants and trial courts this way:

> In most cases the trial judge, with the "satisfaction that proceeds from the consciousness of duty faithfully performed," General Robert E. Lee, Farewell Address to Army of Northern Virginia (Apr. 10, 1865), and a reversal rate among the several circuits ranging from two to fourteen percent, has the added satisfaction of knowing that he has probably resolved the parties' dispute and that they can get on with their business. Not so here.

> Here the parties have fought each other to a standstill and any "victory" is pyrrhic. Given the monetary stakes involved and a Federal Circuit reversal rate exceeding forty percent, this Court is no more than a way station – an intermediate irritating event – preliminary to the main bout in the Federal Circuit. Whatever the merits of such a system, it is undeniably slow and extraordinarily expensive. The most this Court can say is, "Good luck and Godspeed."

Aspex Eyewear, Inc. v. Altair Eyewear, Inc., 818 F. Supp. 2d 348, 365 n.8 (D. Mass. 2011).

The reality of modern patent litigation is that Retailers and others often face the Sisyphean prospect of spending upwards of $5,000,000 through the end of the litigation, preparing and producing early in the litigation their non-infringement and invalidity positions, producing early in the litigation their documents and electronically stored information, conducting full-blown discovery, and litigating dispositive claim construction issues that are reversed nearly half the time on appeal, just to be able to have a court rule that they do not infringe the specific claims of the patent-in-suit or that the specific claims of the patent-in-suit are invalid as anticipated, obvious, lacking a written description, and the like. So long as the plaintiff prices the settlement at less than the massive costs of defense through judgment and appeal, most defendants will opt to settle instead of defending against even a weak patent. *Cf. Eon-Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1327 (Fed.

Cir. 2011) (defendant spent over $600,000 to litigate a case it could have settled for $75,000 or less). Based on these pragmatic concerns, even though weak computer-implemented patents are growing in number, they rarely are litigated to a final judgment that is affirmed on appeal.

Reaffirming that patentability under Section 101 is a threshold issue will provide some measure of relief to Retailers because they will not have to spend millions of dollars and wait until all appeals are exhausted to resolve this gateway issue. The Federal Circuit has confirmed that claim construction is not necessary to resolve the issue of patentable subject matter under Section 101. *See Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1339 (Fed. Cir. 2013). For courts that treat patentability as a threshold issue, it is an issue that can be, and should be, resolved on motions to dismiss, for judgment on the pleadings, or early summary judgment. *See, e.g.*, *OIP Techs., Inc. v. Amazon.com, Inc.*, 2012 WL 3985118, *5 (N.D. Cal. Sep. 11, 2012) (granting motion to dismiss under Section 101 after "conclud[ing] that the procedural posture of this case does not render [the defendant's] motion premature") (brackets added); *SmartGene, Inc. v. Advanced Biological Labs., SA*, 852 F. Supp. 2d 42, 52 (D.D.C. 2012) (granting motion to dismiss noting, "[i]n this case, the section 101 analysis begins and ends the Court's inquiry as it reveals that the patents-in-dispute are not patentable"); *Digitech Information Systems, Inc. v. BMW Financial Services NA, LLC*, 864 F. Supp. 2d 1289, 1292-93 (M.D. Fla.

2012) (granting summary judgment motion under Section 101 over objection that motion was premature); *Glory Licensing LLC v. Toys 'R' Us, Inc.*, 2011 WL 1870591 (D.N.J. May 16, 2011) (granting motion to dismiss); *Graff/Ross Holdings LLP v. Fed'l Home Loan Mortg. Corp.*, 2010 WL 6274263 (D.D.C. Aug. 27, 2010) (granting motion to dismiss).

If patentability under Section 101 instead is treated like any other invalidity defense, to be considered only after full discovery and claim construction, practical considerations make it unlikely that defendants will ever obtain a court ruling on this issue. Patent litigation should not resemble Hermann Hesse's *The Glass Bead Game*, in which players participate for years in an elaborate, abstract game in an ivory tower remaining oblivious to the real-world problems outside. The Retailers, therefore, seek a practical solution to a real-world problem and a solution that flows easily and directly from this Court's jurisprudence on patentability, namely, that computer-implementation alone cannot create patentability.

◆

CONCLUSION

Amici Curiae Retailers request that the Court adopt a threshold test for patentability under 35 U.S.C. § 101 that computer-implementation cannot create patentable subject matter, vacate the judgment below, and remand for reconsideration in light of the announced standard.

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AMICUS
CURIAE
BRIEF

No. 13-298

IN THE

Supreme Court of the United States

ALICE CORPORATION PTY LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL, ET AL.,

Respondents.

On Writ of Certiorari
to the United States Court of Appeals
for the Federal Circuit

BRIEF FOR RICHRELEVANCE, INC., COUPA SOFTWARE, INC., AND TRULIA, INC., AS AMICI CURIAE SUPPORTING RESPONDENTS

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BRIEF FOR RICHRELEVANCE, INC., COUPA SOFTWARE, INC., AND TRULIA, INC., AS AMICI CURIAE SUPPORTING RESPONDENTS

INTEREST OF THE AMICI CURIAE[1]

Amici are leading technology companies. Each them has brought innovative products and services to market. And each of them has faced aggressive litigation from plaintiffs claiming that amici infringe their patents by practicing the plaintiffs' patented business methods, or by running software programs on a computer or encoding software on a disk.

RichRelevance, Inc., is the global leader in omnichannel personalization. RichRelevance works with the world's leading retail brands to customize the experience of shopping those brands' websites. RichRelevance's software can provide personalized product recommendations, offer consumer-targeted promotions, and display products in an order based on each shopper's preferences.

Coupa Software, Inc., delivers an innovative software-as-a-service (SaaS) suite of financial applications that help organizations effectively manage their spending. Coupa works with a broad range of customers, from Fortune 100 to medium-sized business across many industries. The Coupa applications help employees purchase the items they require in an efficient, intuitive manner while maintaining appropriate controls.

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[1] Letters reflecting the parties' consent to the filing of amicus briefs are on file with the Clerk. No counsel for a party authored any portion of this brief. No party and no other entity, except *amici* and their counsel, made any monetary contribution toward the preparation or submission of this brief.

Trulia, Inc. is a leading online real estate marketplace that is redefining the home search experience for consumers and changing the way that real estate professionals build their businesses.

SUMMARY OF ARGUMENT

The Court should reaffirm the central requirement that to be patent-eligible, a claimed invention based on an abstract idea must concretely apply and build on the idea, not merely yoke it to a general-purpose computer or a disk containing software. Robust scrutiny of computer and software patents founded on abstract ideas will meaningfully protect the technology industry by reinforcing the important early escape from expensive infringement litigation that Section 101 of the Patent Act provides.

I. Patents protect inventions, not ideas. Just as a patent cannot claim an abstract idea, it cannot claim an abstract idea limited to a particular context. Yet despite this prohibition, patentees increasingly seek to patent computer software by describing a real-world process and claiming *any* computer, or *any* disk containing *any* instructions, capable of carrying out that process in any way. Such patents add nothing to the real-world process but a self-imposed scope limitation. Where the real-world process is an ineligible abstract idea, tying it generally to a computer does nothing to change that. Allowing abstract ideas to be made patentable by such means would allow "the drafter's art" to triumph over this Court's patent-eligibility doctrine and, potentially, broadly preempt all productive use of certain abstract ideas.

The Federal Circuit has left considerable room for manipulation by merely asking, *e.g.*, whether the computer "plays a meaningful role" in the patented process. *Ultramercial, Inc. v. HULU, LLC*, 722 F.3d 1335, 1349 (Fed. Cir. 2013). But a computer can play a meaningful role even in clearly ineligible claims—imagine patents for any use of a computer in solving trigonometric equations, or the use of a computer in playing Bingo. The latter example is no exaggeration. *See Planet Bingo, LLC v. VKGS, LLC*, No. 1:12-CV-219, 2013 WL 4427811 (W.D. Mich. Aug. 19, 2013).

For a computer-based limitation to make an otherwise abstract idea patentable, the limitation must be addressed to the *how* and not just the *what*. Claiming a computer that performs certain real-world steps, by any path or process, is no different from claiming the real-world steps themselves. And when those real-world steps are as abstract as communication, calculation, or memory, the computer does nothing to solve the abstraction. To be patent-eligible, the invention must explain and claim the way in which the computer or software implements the idea, not the mere combination of the computer and the idea.

II. A potent patent-eligibility doctrine is critical, because it provides an early exit from increasingly expensive patent litigation. All litigation is expensive, but patent litigation is especially expensive. The expense is intensified by the fact that many patent cases are brought in districts with highly compressed pretrial schedules, where litigants must prepare for trial even while summary judgment motions are still being briefed. Holders of invalid patents seek to use this expense to their advantage, calculating that litigants will agree to settle even claims based on weak patents rather than face the expense of defense or the risk of a ruinous injunction if the defense fails. The result is a *de facto* tax on innovation, and one that hits growing technology companies like *amici* especially hard.

Almost alone among patent defenses, Section 101 can cut off this expense via early review as a matter of law. District courts can often decide Section 101 questions on motions to dismiss, or alternatively on early, pre-claim-construction motions for summary judgment. Section 101 defenses also lend themselves to interlocutory review. In contrast, claim construction and additional factual development are required for most Section 102 and 103 patentability defenses. In many cases, factual disputes mean that such defenses can be resolved only at trial, or with trial looming. That does nothing to combat the incentive to settle for substantial figures even when the patent-in-suit is plainly weak.

By providing an early check on ineligible patents and reducing the chance that patent litigation will be punitively expensive regardless of outcome, Section 101 increases the chance that ineligible patents will be reviewed and invalidated. Such invalidations return abstract ideas to the public domain where they belong, opening them up for further innovation.

ARGUMENT

I. Claiming A Computer Does Not Render An Abstract Idea Patentable

Far too often, lower courts applying this Court's test have treated the mere *involvement* of a computer, or computer software, as sufficient to render an abstract idea concrete. Those decisions do not faithfully apply this Court's robust approach to examining patent eligibility. The mere presence of a computer in a "meaningful role" is not a significant limitation; neither is a recitation that the computer's involvement makes the abstract idea more rapid or more marketable. What separates patentable computer-based applications from abstract ideas is giving the computer an *indispensable* role. In general, the invention must specify *how* the computer or software implements the invention, using particular steps and not others, not just *what* the end product of the computer's implementation is. Claiming every conceivable way (and teaching none of the ways) by which a computer implements a real-world step, such as electronic communication or data storage, is no different from a patent on human interaction or memory—clearly too abstract to be patent-eligible.

A. Ideas Are Not Patentable; Only Applications of Ideas Are

Ideas are not patentable, standing alone—not even good ideas. That is especially true of ideas that exist at such a high level of abstraction that they are properly deemed to be part of the general "storehouse of knowledge." *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948). Ideas such as "I buy low and sell high" (Tr. of Oral Arg. 10:9, *Bilski v. Kappos*, No. 08-964) may not be laws of nature like E=mc^2, but they are not patentable, and for essentially the same reason: no inventor deserves the credit for isolating that general notion, and no patentee deserves the right to exclude others from using it during the term of a U.S. patent. They are treated "as though [they] were a familiar part of the prior art." *Parker v. Flook*, 437 U.S. 584, 592 (1978) (*Flook*).

Only when an abstract idea is applied as a concrete invention in a particular context does a patentable invention emerge. In this way, an abstract idea is "a motive" for further development into a patentable invention. *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (*Benson*) (quoting *Le Roy v. Tatham* 55 U.S. (14 How.) 156, 175 (1852)). Thus, this Court has held, patent protection exists for "the *application* of [a non-patentable concept] to a new and useful end." *Id.* (quoting *Funk Bros.*, 333 U.S. at 130) (emphasis added).

Moreover, this Court has properly distinguished "applications" of an abstract idea, which can be patentable, from mere self-restraint in claiming only a portion of an abstract idea, which cannot. The patentable invention must *add something* to the abstract idea, not take something away from it. *Flook*, 437 U.S. at 591. "Buy low, sell high *in the sorghum market*" is just as unpatentable as "buy low, sell high" would be as a general matter. In other words, just because a patentee has made a more specific *claim*, by limiting it to a particular context, does not mean that the patentee has made a specific *invention* rather than merely restating the abstract idea in a limited context. In particular, an inventor cannot establish patent eligibility by "'attempting to limit the use of the formula,'" or the abstract idea, "'to a particular technological environment.'" *Bilski v. Kappos*, 130 S. Ct. 3218, 3230 (2010).

Thus, for example, in *Flook* the invention consisted of a mathematical algorithm or formula. 437 U.S. at 585-86. "[T]he claims cover[ed] a broad range of potential uses of the method"—every use involving the catalytic conversion of hydrocarbons—but did not "cover every conceivable application of the formula." *Id.* at 586. The patent applicant's self-restraint in limiting himself to one (capacious) context, catalytic conversion of hydrocarbons, did not make his claim patentable. *Id.* at 594-95. This Court made clear that this context-limitation added nothing to the formula—the patent application did not, for example, explain a particular means of using the formula in that context, but covered any process implementing the formula for hydrocarbon catalytic conversion. *Id.* at 586. As this Court cautioned, allowing that sort of limitation to convert an abstract idea into a patentable process "would make the determination of patentable subject matter *depend simply on the draftsman's art* and would ill serve the principles underlying the prohibition against patents for 'ideas' or phenomena of nature." *Id.* at 593 (emphasis added).

B. Clever Patentees Frequently Use Computer Or Software Elements To Disguise Their Attempts To Claim Abstract Ideas

Patentees have not given up seeking to use "the draftsman's art" to circumvent the prohibition on patenting abstract ideas. Computers and their software have become favorite tools of the draftsman's art. All too often, a reference to a computer or a CD-ROM is affixed to a claim that does not involve computers, software, or the Internet in *any other way*. That is just the sort of self-imposed limitation that the Court rejected in *Flook*. Yet it is a common strategy.

This strategy is at its most transparent in patents in which the independent patent claim concerns a method of doing something that has nothing to do with a computer (*e.g.*, managing a life insurance policy). The independent claim may then be followed by a dependent claim "requiring that the method be 'performed by a computer.'" *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1271 (Fed. Cir. 2012); *cf.* Pet. App. 167a (Prost, J., panel dissent) ("[T]he representative method claim does not even recite the use of a computer. And while some of the dependent claims recite computers, the specification shows that the use of computers is simply incidental."). The patent does not specify in any way *how* the method is to be performed by a computer: no hardware specifications, no software programming instructions, and no discussion of how the computer would carry out particular real-world steps such as "storing the policy unit value for the current day." *Bancorp Servs.*, 687 F.3d at 1272.

Software patents follow the same trend. The Federal Circuit and Patent Office have for a number of years allowed patentees to obtain patents containing "a so-called 'Beauregard claim.'" *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011). "A Beauregard claim—named after *In re*

Beauregard, 53 F.3d 1583 (Fed. Cir. 1995)—is a claim to a computer readable medium (e.g., a disk, hard drive, or other data storage device) containing program instructions for a computer to perform a particular process." *Id.* Such claims are a way of trying to turn method claims into "manufacture" claims. *Id.* at 1374. But some *Beauregard* claims do not claim any *particular* instructions, or specify how the real-world steps of the method are to be implemented through software.

Thus, for instance, in *CyberSource*, the patent claimed *any disk* containing *any software* that in *any way* carried out the steps specified in the patent. And those steps were real-world steps rather than software steps: "obtaining information" about transactions, "constructing a map" from that information, and "utilizing the map" to answer a question. 654 F.3d at 1374. These steps, of course, describe nothing more than a general approach to thinking about and solving a problem. *Id.* at 1373. As the Federal Circuit explained, "[s]uch a method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible." *Id.* The patentee's self-imposed limitation on this general approach—confining the claim to any computer program implementing it by any path—added nothing to the abstract idea, and could not render it patentable. *See id.* at 1375.

The same is true in this case: petitioner's computer-readable medium claims are "merely method claims in the guise of a device," and the method in question has no essential connection to a computer. Pet. App. 34a (Lourie, J.). Far from building a concrete application on the abstract idea of an "escrow service," the computer-readable medium claims here represent nothing more than a self-imposed limitation of the "escrow" idea to the computer context.

C. Involving A Computer Does Not Make An Idea Less Abstract

The Federal Circuit has tried to respond to this problem, but the verbal formulation it has developed—requiring that the computer "play[] a meaningful role" in the patented process—is inadequate. *Ultramercial*, 722 F.3d at 1349. There are various ways in which a computer can be *involved* without being part of the patentable *innovation*. Consider, for example, applying mathematical principles or other abstract ideas to manipulate certain data that exist only on a computer. The computer "plays a . . . role" in the claimed invention, but the computer does not meaningfully add to the abstract idea. Rather, what is claimed is the mathematical or other abstract principle by which the data are manipulated. And that is no different from the patent application this Court rejected in *Benson*, 409 U.S. at 71-72, for converting data using a computer. Thus, it did not matter in *CyberSource* that the data being mapped and analyzed were *IP address* data, rather than *street address data*, even though the involvement of computers is necessary to generate or identify an IP address. 654 F.3d at 1370.

Similarly, a method of estimating an object's location that involves measuring the distance between the object and certain specified points, and then doing the necessary calculations to triangulate the object's position, could be implemented equally well whether the object to be located is a computer or a toaster. The idea may be more *useful* or *marketable* for a computer than for a toaster. But it is still an abstract idea involving mathematical formulae. A patent's claim for such a method gains nothing from a limit for use only to locate computers—such a limit is a mere self-imposed limitation.

Yet under the Federal Circuit's current haphazard law, all too often the wholly superficial involvement of a machine such as a computer is deemed sufficient. The method of estimating location just discussed is a real-world example: the Federal Circuit upheld a patent for calculating position and time using a GPS receiver, and it emphasized that a "GPS receiver is a machine and is integral to each of the claims at issue." *SiRF Tech., Inc. v. ITC*, 601 F.3d 1319, 1332 (Fed. Cir. 2010). Without the receiver, the Federal Circuit said, it would be impossible to estimate the distance between that receiver and the satellite sending signals to it. *Id.* That is wholly circular logic that in no way distinguishes the GPS receiver from a toaster. Perhaps the GPS invention was patentable under a proper analysis, *e.g.*, if it relied on data that *only a GPS receiver* could provide. But that is not what the Federal Circuit said.

The federal courts have regularly seen this phenomenon in the context of doing business over the Internet. E-commerce is still commerce, and "the common storehouse of knowledge" includes centuries of information about how vendors and customers do business with one another. Taking orders or complaints over the Internet is not *intrinsically* any different from taking orders or complaints over the telephone or by mail—patents for such activities are abstract ideas, and patents for such activities *on the*

Internet merely add a self-imposed limitation to those underlying ideas. *See, e.g.*, *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 40 (Fed. Cir. 2012) (Mayer, J., dissenting) (contending that patents-in-suit were invalid under Section 101 because they "simply describe[d] a basic and widely-understood concept—that it is useful to provide people with reminders of important due dates and deadlines—and then appl[ied] that concept using conventional computer technology and the Internet"), *cert. denied*, 133 S. Ct. 1291 (2013). On the other hand, an invention likely is patent-eligible if it directs its claims to some aspect specific to e-commerce or computing that makes the invention an improvement over the prior art, adding a specific application to the underlying abstract idea.

D. If Patent Eligibility Depends On The Presence Of A Computer, The Invention Must Be Directed To The Computer As A Meaningful Limitation On The Claim

If patent eligibility depends on the presence of a computer—*i.e.*, the patentee claims that the computer takes the invention out of the realm of abstract ideas—the presence of the computer must impose "meaningful limits on the claim's scope." *In re Bilski*, 545 F.3d 943, 961 (Fed. Cir. 2008), *aff'd*, 130 S. Ct. 3218 (2010). Thus, the invention must be directed to the computer as a unique part of the solution or as an improvement in computer technology. *Cf. Ultramercial*, 722 F.3d at 1348 (reciting these concepts but ultimately allowing a much more permissive test). For example, an invention that specified *how* it will be implemented on a computer, using particular steps and not others, would be patentable. An invention that claims *what* the computer will accomplish but not *how* cannot be patentable under this Court's cases.

For instance, software patents that actually *claim particular software*, rather than what the software *accomplishes*, are more likely directed to the software than to the (abstract) method being implemented. Patentees are perfectly capable of claiming particular details of software architecture, specific to particular software environments. *See, e.g.*, *Nazomi Commc'ns, Inc. v. Samsung Telecomms., Inc.*, No. C-10-05545, 2012 U.S. Dist. LEXIS 39468, at *7 (N.D. Cal. Mar. 21, 2012). Such a claim does not broadly preempt every possible way of accomplishing a particular goal; it leaves inventors free to develop and market their own design to accomplish the same goal. And, crucial to the patent-eligibility analysis, they add content to any underlying abstract ideas by specifying a particular way of implementing them.

Similarly, inventions that claim a particular, improved way of performing a particular function using a computer do not pose the preemption problem—almost by definition, because they leave available the old way of doing things. For instance, in *Research Corp. Technologies v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010), the challenged methods produced "higher quality halftone images while using less processor power and memory space," *id.* at 865. Because those methods "plainly represented improvements to computer technologies in the marketplace," *Bancorp*, 687 F.3d at 1279 (citing *Research Corp.*, 627 F.3d at 865), the computer-implemented aspect of the claim added significantly to the algorithms involved in the rendering process, and was a meaningful limitation on the claim.

Improving what computers do differs dramatically from improving on what *humans* do. As this Court has explained, and the Federal Circuit sometimes has agreed: simply because a computer does a task faster and better than a human could, or an army of humans could, does not make the use of "a computer," writ large, into a limiting application of an otherwise abstract idea. *See, e.g.*, *Benson*, 409 U.S. at 65 (noting that a computer "solv[es] a problem by doing arithmetic as a person would do it by head and hand"); *Bancorp*, 687 F.3d at 1279 (a computer does not make invention patent-eligible where "the computer simply performs more efficiently what could otherwise be accomplished manually"); *Planet Bingo, LLC*, 2013 WL 4427811, at *11 ("[T]he use of a computer in the method claims adds nothing more than the ability to manage a game of Bingo more efficiently."). Were it otherwise, virtually *every* complex natural law would become patentable, because as a practical matter the intensive calculations necessary to calculate complex statistical relationships or galactic movements can be done only by computers. That is not the law.

II. Robust Patentability Doctrine Provides Patent Defendants With Needed Protection Against Skyrocketing Litigation Costs

Petitioner argues for a lenient rule of patent eligibility that would allow its claims to survive review under Section 101. But never fear, petitioner insists—other defenses under the Patent Act will solve the problem that a lenient rule of patent-eligibility would create, by invalidating patents that are anticipated, obvious, or subject to some other statutory defense. *See, e.g.*, Pet. Br. 2-4, 42; *see also, e.g.*, AIPLA Br. 12-13; Pet. App. 111a (Newman, J., concurring in part, dissenting in part) (asserting that any patent that recites a statutory subject matter should survive the test of Section 101); *id.* at 129a-130a (Rader, C.J., additional reflections). This Court has heard such reassurances before, and has properly—and unanimously—rejected them because they would leave Section 101 "a dead letter." *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1303-04 (2012).

Section 101 is not just one of the "explicit conditions" on which patentability depends. *Graham v. John Deere Co.*, 383 U.S. 1, 12 (1966). It is a crucial one. Weakening that limitation would remove an important brake from a patent-litigation system that is already threatening to careen out of control. Section 101, almost uniquely among the defenses that a patent defendant can raise, can spare the defendant much of the cost of *litigation* as well as the threat of *liability*. It is a question of law; it is susceptible to early resolution by the court before money is sunk into the most extensive phases of the case; and it may even be suitable for interlocutory review. By contrast, the defenses that petitioner cites, given their frequently fact-intensive nature, may cost more to litigate than the infringement case. They generally will be submitted to a jury at the same time as the infringement case and, often, the damages evidence. And appellate review most often comes only after an adverse verdict—which in patent cases can be in the billions.[2]

The Court cautioned in *Bilski* that "[i]f a high enough bar is not set when considering patent applications" for business methods under Section 101, "patent examiners and courts could be flooded with claims that would put a chill on creative endeavor and dynamic change." 130 S. Ct. at 3229. One key reason why that "high . . . bar" is useful is that a patent must clear it relatively early in the process. Lowering the "high . . . bar" of Section 101, on the theory that defendants can rely on anticipation, obviousness, and other such defenses, risks allowing litigation costs to impose exactly the "chill on creative endeavor" that this Court feared.

A. The Cost Of Patent Litigation Poses A Grave Threat To The Technology Industry

Patent litigation is a tax on innovation—a hefty one that only keeps increasing. A high-stakes patent case can easily cost the defendant $4 million or more to litigate through trial.[3] And because modern products embody hundreds or even thousands of different technological innovations,[4] technology companies like *amici* may face repeated patent lawsuits, any one of which could conceivably result in an injunction crippling a key product, or a massive damages award. Patent litigation continues to be the fastest-growing category of litigation, with the number of cases filed more than doubling between 2003 and 2013.[5]

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[2] *See, e.g.*, *Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, No. 09-290, ECF No. 762 (W.D. Pa. Dec. 26, 2012) (jury award of $1.17 billion, potentially subject to enhancement under 35 U.S.C. § 284).

[3] In a 2013 survey, the *median* cost of trying a patent case against a non-practicing entity ("patent troll"), with more than $25 million at stake, was $4 million. That means half of the 87 cases included in the survey cost more. Cases in some geographic areas cost more than $9 million. *See* Am. Intellectual Prop. Law Ass'n, *Report of the Economic Survey 2013*, at I-148 (2013) (AIPLA *Economic Survey*).

Many of these lawsuits are brought by entities that seek to use the cost of litigation to their advantage: because testing even a weak patent in court can be both expensive and risky, they calculate that many defendants will agree to pay a monetary settlement and an ongoing royalty.[6] The cost of litigating or settling thus becomes deadweight loss, increasing the costs for consumers and damaging the incentives to invest in innovation. *See* Nat'l Research Council of the Nat'l Academies, *A Patent System for the 21st Century* 95 (Stephen A. Merrill, Richard C. Levin & Mark B. Myers eds., 2004). Conversely, facilitating early resolution of weak patent cases lowers the expected litigation costs and promotes innovation.

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[4] "A single computer program may contain hundreds or thousands of components or elements; a computer chip may have millions of parts." *Perspectives on Patents: Post-Grant Review Procedures and Other Litigation Reforms: Hearing before the Subcomm. on Intellectual Prop. of the S. Comm. on the Judiciary*, 109th Cong. 44-45 (2006) (statement of Mark Chandler, Senior Vice President and General Counsel, Cisco Systems).

[5] *Compare* Admin. Office of U.S. Courts, *Caseload Statistics 2003*, Table C-2 (Mar. 31, 2003), at 44, *with* Admin. Office of U.S. Courts, *Caseload Statistics 2013*, Table C-2 (Mar. 31, 2013), at 4.

[6] Jeremiah Chan & Matthew Fawcett, *Footsteps of the Patent Troll*, 10 Intell. Prop. L. Bull. 1, 3, 4 (2005) (Chan & Fawcett).

Validity challenges are particularly important in this context, precisely because many of the patents in question are so broadly drafted as to preempt entire areas of scientific exploration.[7] But as this Court has observed, "it is often more difficult"—and hence more expensive—"to determine whether a patent is valid than whether it has been infringed." *Cardinal Chem. Co. v. Morton Int'l*, 508 U.S. 83, 99 (1993).

A substantial amount of the cost of litigation is attributable to trial and preparing for trial after the close of discovery. A recent survey found that the median cost of patent litigation was almost double the median cost of getting through discovery.[8] And discovery itself contributes to soaring costs. For the highest-dollar cases, the median cost of getting through discovery was $3 million.[9] As this Court has observed, especially in cases that do not go to trial, the expense of discovery is the primary driver of cost. *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 558-59 (2007).

While summary-judgment motions on other defenses sometimes are an option, as discussed further below, as a practical matter much of the pretrial expense has already been incurred before a summary judgment motion can be filed or decided. *See, e.g.*, Jay P. Kesan & Gwendolyn G. Ball, *How Are Patent Cases Resolved? An Empirical Examination of the Adjudication and Settlement of Patent Disputes*, 84 Wash. U. L. Rev. 237, 246 (2006) (concluding based on the empirical evidence that "all rulings, including grants of summary judgment, appear to be expensive").

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[7] Chan & Fawcett at 4.

[8] *See* AIPLA *Economic Survey* I-135, I-136.

[9] AIPLA *Economic Survey* I-135.

Indeed, in some circumstances a portion of the *trial* expense has already been incurred before summary judgment. That problem is attributable in part to the rise of "rocket dockets," such as the Eastern District of Texas, which force patent litigation into a compressed schedule. While "compressed" might sound like the same thing as "cheap," in practice a rocket-docket schedule deprives the parties of the ability to sequence their case to litigate defenses early, even very strong defenses. "[T]he high volume of work and the limited period of time does not permit incrementalism," so litigants generally must "allocate trial-sized teams from the outset." Saurabh Vishnubhakat, *Reconceiving the Patent Rocket Docket: An Empirical Study of Infringement Litigation 1985–2010*, 11 J. Marshall Rev. Intell. Prop. L. 58, 62 (2011). Summary judgment motions may not be briefed until just a few weeks before trial,[10] and decided on the very eve of trial.

Thus, any tool allowing for early challenges to weak patents is potentially extremely valuable—not just to particular defendants, but to the technology industry as a whole. The prospect of an early challenge diminishes the *in terrorem* effect of litigation. And when such a challenge is successful, it may provide relief to more than one defendant. *See Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found.*, 402 U.S. 313 (1971) (once a patent is invalidated, issue preclusion bars asserting it against other defendants as well).

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[10] *See, e.g.*, Dabney J. Carr, IV & Robert A. Angle, *Litigating Patent Infringement Cases in the "Rocket Docket" of the Eastern District of Virginia*, Intell. Prop. & Tech. L.J., June 2010, at 16.

As discussed below, this Court's jurisprudence under Section 101, particularly in recent years, has offered an increasingly useful means to challenge weak patents and to avoid potentially millions of dollars in legal expenses.

B. Patentability Under Section 101 Is A Question Of Law, Which The Courts Decide Free Of Any Presumptions

Eligibility under Section 101 lends itself to early resolution. It requires no factually intensive comparison between the patent claims and the prior art, and it is ultimately a question of law: do the patent claims fit the statutory subject matter, or do they fall into one of the exceptions, as construed by this Court?

For that reason, district courts have been willing to resolve Section 101 questions on motion to dismiss, often quite early in the case.[11] While in almost any other area of the law a motion to dismiss would hardly be remarkable, these Section 101 decisions are notable in the patent context because successful motions to dismiss are relatively rare in patent litigation. *See* Fed. Jud. Ctr., *Manual for Complex Litiga-*

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[11] *See, e.g.*, *Cardpool, Inc. v. Plastic Jungle, Inc.*, No. C 12-04182, 2013 WL 245026, at *1 (N.D. Cal. Jan. 22, 2013), *aff'd*, No. 2013-1227, 2014 WL 322026 (Fed. Cir. Jan. 30, 2014); *OIP Techs., Inc. v. Amazon.com, Inc.*, No. C-12-1233, 2012 WL 3985118, at *1 (N.D. Cal. Sept. 11, 2012); *see also Clear with Computers, LLC v. Dick's Sporting Goods, Inc.*, No. 6:12-CV-674, ECF No. 116 (E.D. Tex. Jan. 21, 2014) (granting Rule 12(c) motion for judgment on the pleadings).

tion (Fourth) § 33.23, at 618 (2004) (*Manual for Complex Litigation*) (noting that complaints and answers in patent cases are usually so "generalized" as to be "of little assistance to the court or the parties"). Unlike most other patent questions, failure to satisfy Section 101 is the sort of "basic deficiency" that can and should be identified on a Rule 12 motion, "at the point of minimum expenditure of time and money by the parties and the court." *Twombly*, 550 U.S. at 558 (citations omitted).

A panel of the Federal Circuit has recently sought to throw cold water on the notion that patent eligibility can be litigated at the pleading stage. *See Ultramercial, Inc.*, 722 F.3d at 1338-40. The Federal Circuit opined that dismissal is improper unless "the *only* plausible reading of the patent [is] that there is clear and convincing evidence of ineligibility." *Id.* at 1339. That rationale is—to say the least—in considerable tension with the well-established principle that both patentability and claim construction are questions of law.

Congress has codified a statutory presumption that a patent is valid, 35 U.S.C. § 282, and this Court has interpreted that statute to incorporate a heightened "clear and convincing" burden. *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2246 (2011). But as several Members of this Court took the trouble to explain in *Microsoft*, the federal courts resolve questions of law without regard to a burden of persuasion or a quantum of proof. "[T]he evidentiary standard of proof applies to questions of fact and not to questions of law." *Id.* at 2253 (Breyer, J., concurring). And the relevant questions—what a patent claims, and whether that claim is patent-eligible—are questions of law. Courts construing a patent decide what the patent claims, not what it clearly and convincingly claims.

Accordingly, this Court said nothing in *Microsoft* to endorse the notion that the courts should presume that an invention is patent-eligible.[12] Nor did the Court advert to the presumption of validity in any of its cases invalidating patents (or upholding them) under Section 101. Indeed, to the extent that the presumption is based on the notion that the Patent Office probably has done its job right, *see id.* at 2243, 2249, no such rationale applies to a patent-eligibility decision: the Federal Circuit has made clear that precisely because patent-eligibility is a pure question of law, it will not defer to the Patent Office's determination that a claim is or is not patent-eligible, but will review it *de novo. See In re Comiskey*, 554 F.3d 967, 975 (Fed. Cir. 2009).

Thus, the presumption of validity in no way relieves a district court of its duty to decide the legal question of what a patent covers, using the accepted tools of patent interpretation—just as a district court can and must construe a contract on a motion to dismiss. And in resolving that question of law, elevated burdens like "clear and convincing" have no place in the legal analysis. Moreover, the district court need not accept the patentee's reading of the patent on a motion to dismiss, except to the extent it rests on competing plausible *factual* issues (such as how a person of ordinary skill in the relevant art would have interpreted a relevant claim term).[13] And in the context of patent eligibility, such plausible factual disputes are likely to be less common than the Federal Circuit forecast in *Ultramercial*, because the court confused the existence of a factual dispute with the existence of legal ambiguity. 722 F.3d at 1339. A contract or a statute may be ambiguous in the sense that there is more than one permissible reading, but that does not mean that a court cannot arrive at a correct construction as a matter of law. Even in those contexts where factual information may shed light on the ambiguity, the facts may not be *contested* facts; rather, the resolution often will turn on the legal *significance* of those facts, a question of law.

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[12] *See Microsoft*, 131 S. Ct. at 2242-43 (mentioning other invalidity defenses but not eligibility).

C. Patentability Often Can Be Decided Before The Most Costly Phases Of Patent Litigation

Even where patent eligibility under Section 101 is not litigated on the pleadings under Rule 12, it can still be resolved in a targeted way before the defendant must incur the full cost of litigating a patent case with multimillion-dollar sums at stake. As this case illustrates, patentability can often be resolved on summary judgment with a relatively modest investment of resources by the defendant. Other defenses under the Patent Act require much greater factual development, much more time—and much more money.

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[13] *See Ashcroft v. Iqbal*, 556 U.S. 662, 678 (2009) ("[T]he tenet that a court must accept as true [at the pleading stage] all of the allegations contained in a complaint is inapplicable to legal conclusions.").

Patent eligibility under Section 101 can often be resolved without undertaking a full claim construction—either on motion to dismiss, as discussed above, *see* note 11, *supra* (citing cases), or at summary judgment. *See, e.g.*, *Ultramercial*, 722 F.3d at 1339 (acknowledging that "claim construction may not always be necessary for a § 101 analysis"); *accord, e.g.*, *Cyberfone Sys., LLC v. Cellco P'ship*, 885 F. Supp. 2d 710, 715 (D. Del. 2012) (granting summary judgment without claim construction), *aff'd*, No. 2012-1673 (Fed. Cir. Feb. 26, 2014). Even if the parties will dispute the meaning of the claims in other phases of the litigation, they may well be able to ignore that dispute for purposes of Section 101. In this case, for example, respondents simply stipulated for purposes of summary judgment to petitioner's plausible claim constructions, and contended that the patent failed to claim eligible subject matter no matter how it was construed. Pet. App. 6a; *accord, e.g.*, *Compression Tech. Solutions LLC v. EMC Corp.*, No. C-12-01746, 2013 WL 2368039, at *3, *8 (N.D. Cal. May, 29, 2013) (granting summary judgment of invalidity on Section 101 grounds, because even accepting the patentee's proposed claim construction, the claims were not patent eligible).

By contrast, for many if not all of the defenses that petitioner urges are a sufficient safeguard, a full claim construction is a prerequisite. *See, e.g.*, *Key Pharm. v. Hercon Labs. Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998) (explaining that "the first step" in "[a] determination of anticipation, as well as obviousness," "is construing the claim"). And even though, as noted, the Federal Circuit treats claim construction as a question of law,[14] a district court's resolution of that question can be "lengthy and expensive." *Manual for Complex Litigation* § 33.223, at 609. As Judge O'Malley of the Federal Circuit (a former district judge and veteran of patent trials) recently explained, district courts undertaking claim construction often "conduct live hearings with argument and testimony, sometimes covering several days," in addition to receiving written briefing. *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 659 F.3d 1369, 1374 (Fed. Cir. 2011) (O'Malley, J., dissenting from denial of rehearing en banc), *cert. denied*, 133 S. Ct. 833 (2013).

But claim construction is only the beginning. The application of other statutory defenses to the patent as construed certainly will require fact development. Anticipation under 35 U.S.C. § 102 is entirely a question of fact.[15] And several of the other defenses may be styled questions of law, but as this Court has said, that legal conclusion invariably rests on the outcome of "several basic factual inquiries." *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) (obviousness under 35 U.S.C. § 103).[16] For instance, obviousness and anticipation both involve a factual comparison of the invention to the prior art. *Key*, 161 F.3d at 714. These defenses, therefore, are tried to the jury if there is any dispute over the material facts.

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[14] *See, e.g.*, *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998) (en banc).

[15] *E.g.*, *Taurus IP, LLC v. DaimlerChrysler Corp.*, 726 F.3d 1306, 1322 (Fed. Cir. 2013).

[16] *Accord, e.g.*, *Hamilton Beach Brands, Inc. v. Sunbeam Prods., Inc.*, 726 F. 3d 1370, 1375 (Fed. Cir. 2013) (on-sale bar under 35 U.S.C. § 102(b)).

Thus, by the time the jury resolves defenses such as obviousness or anticipation, the case is over: the jury may already have found infringement, damages, and perhaps even willful infringement permitting an enhancement of damages. Submitting the invalidity case to the jury means submitting the *whole* case to the jury, with the attendant expense of trial and risk of an adverse verdict. Thus, even if the defendant is confident in its obviousness or anticipation defense, those defenses frequently are not resolved until too late to be fully useful. Far too often, the incentives are to settle rather than test the patent, especially when settlement is just less than the cost of mounting the necessary defense. *See generally* Kesan & Ball, *supra*, at 246, 272 (finding that "the vast majority of [patent] cases settle"). And with no judgment of invalidity against it, the patentee is left free to assert the patent against the next target.

D. Patent-Eligibility Challenges Facilitate Interlocutory Review That Can Help Hasten The Termination Of Litigation

The expense of patent litigation is compounded by the fact that appellate review, even of case-dispositive issues, is not available until the end of the case, after both infringement and invalidity may well have been tried to a jury over many days. While the Federal Circuit has the authority to review "controlling question[s] of law" that may "materially advance the ultimate termination of the litigation," 28 U.S.C. § 1292(b); *see id.* § 1292(c)(1), it has been extraordinarily sparing in its exercise of that discretionary power. For instance, in its entire history, the court has decided only *one* claim-construction appeal on an interlocutory basis, and then only under "peculiar circumstances." *Portney v. CIBA Vision Corp.*, 401 F. App'x 526, 529 (Fed. Cir. 2010). The Federal Circuit even declined to take up threshold legal issues in this very litigation. 411 F. App'x 306 (2010).

But Section 101 issues, more than any other invalidity issue that district courts confront in patent litigation, lend themselves to judicial resolution on interlocutory review. Preserving a robust role for Section 101 may encourage the Federal Circuit to take up more of these issues on an interlocutory basis, rather than wait for an appeal from final judgment after the parties have invested considerable effort in a full-blown trial.

In addition, deciding Section 101 challenges will allow the Federal Circuit to provide guidance on legal questions of patent eligibility (consistent with this Court's judgment in this case) that affect the Patent Office's consideration of patents. Since the recent amendments to the Patent Act, administrative tribunals within the Patent Office can now consider questions of patentability as part of the new procedures of post grant review and inter partes review.

* * * * *

Throughout petitioner's brief is the theme that the abstract-idea test is a "judicial" or "judicially crafted" exception, and that the Court should therefore apply it more leniently than the defenses such as obviousness and anticipation to which petitioner points. Perhaps that argument might have had some force before the Civil War, when this Court first held that "a principle is not patentable." *Le Roy*, 55 U.S. (14 How.) at 175. But now the abstract-idea exception, and other exceptions, to patent eligibility are firmly enshrined in patent law. *Cf. Microsoft*, 131 S. Ct. at 2246 (concluding that Congress silently ratified the clear-and-convincing standard). Significantly, Congress has recently given extensive attention to the Patent Act, including the problem of business method patents. It voiced extensive concern about the drag that non-inventive patent litigation creates on the economy. And it created new procedures allowing flawed patents to be challenged.

In short, Congress not only has left this Court's "abstract idea" jurisprudence in place, it has *ratified* it and *relied on it*. This Court's interpretation of Section 101 sets forth the Court's "understanding of what the statute has meant continuously since the date when it became law." *Rivers v. Roadway Express, Inc.*, 511 U.S. 298, 313 n.12 (1994). And Congress has, after extensive examination, left that consistent understanding in place. The most recent comprehensive revision, the Leahy-Smith America Invents Act, was adopted in 2011, after this Court's most recent reaffirmation of the abstract-idea principle in *Bilski*. There can be no doubt that Congress was well aware of this Court's jurisprudence on the subject of patentability. And far from disturbing that doctrine, Congress made absolutely clear that it did not want to shift patentability doctrine in either direction. *See, e.g.*, AIA § 18(e), 125 Stat. at 331 (adoption of special procedure for review of certain business-method patents shall not "be construed as amending or interpreting categories of patent-eligible subject matter set forth under section 101"); *id.* § 14(d), 125 Stat. at 328 (after invalidating one class of business-method patents, providing that "[n]othing in this section shall be construed to imply that other business methods are patentable or that other business method patents are valid").

For this Court to continue applying the law as laid down is not some kind of disfavored judicial exception-making, any more than its application of the clear-and-convincing standard is. Indeed, it would be far more disruptive for this Court now to shrink from enforcing the robust doctrine that the Court has laid down over the years.

CONCLUSION

The judgment of the court of appeals should be affirmed.

Respectfully submitted.

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AMICUS
CURIAE
BRIEF

No. 13-298

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Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,

Petitioner,

v.

CLS BANK INTERNATIONAL AND
CLS SERVICES LTD.,

Respondents.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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I. STATEMENT OF INTEREST

SHFL entertainment, Inc. ("SHFL"), based in Las Vegas, Nevada, is a leading global supplier of innovative products and technologies for the gaming industry, including table games, electronic game table systems, electronic betting interfaces, electronic gaming machines, website games, casino utility products, and other casino-based products (collectively "casino-based products and technologies"). For decades, SHFL has invested millions of dollars to design, develop, and promote new casino-based products and technologies that are widely used throughout the world. SHFL owns a sizeable portfolio of United States patents relating to its casino-based products and technologies, and relies on those patents to protect its significant investments. As a leading recipient and licensor of patents, SHFL is committed to maintaining both the integrity of the United States patent system and the quality of the patents themselves.

SHFL takes no position on the merits of the case based on the particular facts presented. Instead, SHFL submits this brief to support a decision by this Court, along the lines presented below, that would ensure that the patent laws continue to provide the incentives granted in the Constitution to promote the progress of science and the useful arts.[1]

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[1] Pursuant to Supreme Court Rule 37.6, counsel listed on the cover states that this brief was authored by *amicus curiae* and reviewed by counsel, and that no counsel for a party authored this brief in whole or in part. Nor did any counsel for a party make a monetary contribution intended to fund the preparation or submission of this brief. In addition, all parties have consented to the filing of the *amicus* brief, and their consent letters are on file with the Clerk's office.

II. SUMMARY OF ARGUMENT

Article I, Section 8 of the Constitution grants Congress broad power to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." Hence, the Constitution weaves into our national fabric the policy of rewarding inventors for their creative endeavors. Given its constitutional charge, Congress enacted the Patent Act of 1790. Since then, Congress has steadfastly supported the rights of inventors and the patent system as a whole.

Title 35 of the United States Code section 101, which finds its roots in the Patent Act of 1790, defines patent-eligible subject matter as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." Congress intended § 101 to be given wide scope. That is undisputed. A broad interpretation of § 101 undoubtedly fulfills the constitutional and statutory goal of promoting "the Progress of Science and useful Arts."

This Court recognizes three exceptions to patent-eligible subject matter under § 101 for laws of nature, natural phenomena, and abstract ideas. These exceptions are intended to cover the basic tools of scientific and technical work. They are well-established and reflect sound policy. Yet § 101 contains no express limitations, and this Court has repeatedly cautioned against reading into the patent laws limitations and conditions that the legislature has not expressed. Thus, an obvious tension exists between the statute and its judge-made exceptions.

To ease the tension, this Court has applied § 101 broadly, and the exceptions to it narrowly. It has resisted bright-line, categorical rules to determine patent-eligibility. It has endorsed flexibility over rigidity. In sum, this Court has demonstrated restraint in limiting § 101's scope to avoid reaching results that would inadvertently undermine the patent system as a whole.

This Court has now been asked to draw a bright-line as to whether claims to computer-implemented inventions are directed to patent-eligible subject matter within the meaning of § 101. It should refrain from doing so. Adopting a bright-line test here would represent a significant and disturbing departure from this Court's precedents. Moreover, adopting a single standard applicable to computer-implemented inventions may create unintended obstacles in other areas. Indeed, fashioning an overly restrictive standard for computer-implemented subject matter may inadvertently impede patentability on a wide range of other subject matters legitimately falling within the scope of § 101.

Rather, the Court should articulate a flexible inquiry to be applied in such cases under § 101. The inquiry could include a non-exhaustive list of factors drawn from this Court's precedents to aid the lower courts and the United States Patent and Trademark Office in resolving § 101 inquiries on a case-by-case basis. The inquiry should emphasize the limited scope of the exceptions to § 101 and the statutory presumption of validity afforded to all issued patents.

Finally, this Court should endorse a judicial approach to § 101 disputes where courts first address the invalidity defenses under §§ 102, 103, and 112 before addressing issues of patent eligibility under § 101, particularly in cases where the abstract ideas exception is raised.

III. ARGUMENT

A. The Language, History, And Purpose Of § 101 Support A Broad Interpretation Of Patent-Eligible Subject Matter

The Constitution grants Congress broad power to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." U.S. Const. art. 1, § 8, cl. 8. Congress implemented this grant by broadly defining patent-eligible subject matter to include "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. Section 100(b) further provides that the "term 'process' means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."

As outlined by Chief Judge Rader in his underlying opinion, Congress intended § 101 to be given wide scope. *See CLS Bank Intern. v. Alice Corp. Ltd.*, 717 F.3d 1269, 1294-97 (Fed. Cir. 2013) (Rader, C.J., concurring-in-part and dissenting-in-part). Specifically, to understand §§ 101 and 100(b) in context, this Court has advised that the "new" requirement in § 101 is now governed by § 102. *Diamond v. Diehr*, 450 U.S. 175, 189 (1981); *see* S. Rep. No. 82-1979, at 6 (1952) ("Section 102 . . . includes, in effect, an amplification and definition of 'new' in section 101.").

Similarly, whether a process, machine, manufacture, or composition of matter is "inventive" is not an issue under § 101; the condition for "more" than novelty is contained only in § 103. *See Dann v. Johnston*, 425 U.S. 219, 225-26 (1976) (explaining that although "an exercise of the of the inventive faculty" has been used as a judicial test, "it was only in 1952 that Congress, in the interest of uniformity and definiteness, articulated the requirement in a statute, framing it as a requirement of 'nonobviousness.'") (internal quotations and footnote omitted). Thus, as long as the "conditions and requirements" of patentability are met, a person who invents or discovers a useful process, or an improvement to one, may obtain a patent – and may do so even if the process includes only a new use of an old machine. *See Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010).

Section 101's breadth is demonstrated by, *inter alia*, the use of expansive categories modified by the comprehensive term "any." In "choosing such expansive terms . . . modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope." *Diamond v. Chakrabarty*, 447 U.S. 303, 308-309 (1980); *Bilski*, 130 S. Ct. at 3225 ("Congress took this permissive approach to patent eligibility to ensure that 'ingenuity should receive a liberal encouragement.'" (quoting *Chakrabarty*, 447 U.S. at 308)).

Section 101's breadth is further demonstrated by the expansive definition of "process" in § 100(b). The "primary significance" of adding § 100(b) to the Patent Act of 1952 was to clarify that a method was not "vulnerable to attack, on the ground of not being within the field of patentable subject matter, merely because it may recite steps conventional from a procedural standpoint and the novelty resides in the recitation of a particular substance, which is old as such, used in the process." P.J. Federico, *Commentary on the New Patent Act*, reprinted in 75 J. Pat. & Trademark Off. Soc'y 161, 177 (1993); *see* S. Rep. No. 82-1979, at 17 ("The . . . definition clarifies the status of processes or methods which involve merely the new use of a known process, machine, manufacture, composition of matter, or material; they are processes or methods under the statute and may be patented provided the conditions of patentability are satisfied."). Thus, as noted by the Federal Circuit, changes were made to the 1952 Act to *broaden* patent-eligible subject matter and *eliminate doubt* caused by narrow interpretations given the prior statute. *See Ultramercial, Inc. v. Hulu, LLC*, 722 F.3d 1335, 1340 (Fed. Cir. 2013). "Moreover, not only did Congress expand the definition of 'process' in 1952, but Title 35 does not list a single ineligible category. At the time when Congress considered § 101, it broadened the statute and certainly did not place any specific limits on it." *Id.* at 1340-41.

Additionally, in testimony requested by Congress, P.J. Federico, former chief patent examiner at the United States Patent & Trademark Office who co-drafted the Patent Act of 1952, explained that under the proposed amendment patent-eligible subject matter may include "anything that is under the sun that is made by man." Hearing Before Sub-comm. No. 3 of the Comm. On the Judiciary, at 37 (1951); *see* S. Rep. No. 82-1979, at 5 (stating the same principle: so long as the conditions of patentability are met, anything made by man is patentable). The Supreme Court summarized the intent and meaning of these changes when it quoted and approved this famous statement. *See Diehr*, 450 U.S. at 182.

In sum, "[t]he subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting 'the Progress of . . . the useful Arts. . . .'" *Chakrabarty*, 447 U.S. at 315. This has been true for over 200 years to ensure that "ingenuity should receive a liberal encouragement." *Id.* at 308-09 (quoting 5 Writings of Thomas Jefferson 75-76 (H. Washington ed. 1871)).

B. The Abstract Ideas Exception To § 101 Should Be Applied Extremely Narrowly

This Court recognizes three judge-made exceptions to § 101 for laws of nature, natural phenomena, and abstract ideas. *Mayo Collaborative Servs. v. Prometheus Labs.*, 132 S. Ct. 1289, 1293 (2012). These exceptions reflect sound policy and have generally defined § 101's reach going back over 150 years. *Bilski*, 130 S. Ct. at 3225 (2010) (citing *Le Roy v. Tatham*, 14 How. 156, 174-175 (1853)). They are intended to cover the basic tools of scientific and technical work. *Mayo*, 132 S. Ct. at 1293.

But the legislature has never expressly limited § 101's scope beyond its text, and this Court has repeatedly cautioned that courts "should not read into the patent laws limitations and conditions which the legislature has not expressed." *Chakrabarty*, 447 U.S. at 308 (quoting *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 199(1933)). Indeed, to avoid improper narrowing by courts of congressional enactments, resort to judge-made exceptions to statutory grants must be rare. *See Western Union Tel. Co. v. Lenroot*, 323 U.S. 490, 514 (1945) ("[T]he judicial function does not allow us to disregard that which Congress has plainly and constitutionally decreed and to formulate exceptions which we think, for practical reasons, Congress might have made had it thought more about the problem"); *United States v. Rutherford*, 442 U.S. 544, 559 (1979) ("Whether, as a policy matter, an exemption should be created is a question for the legislative judgment, not judicial inference.").

Accordingly, an obvious tension exists between the judge-made exceptions to § 101 and the statute's plain language, history, and purpose. *See generally*, *Chakrabarty*, 447 U.S. at 308 ("In choosing such expansive terms as 'manufacture' and 'composition of matter,' modified by the comprehensive 'any,' Congress plainly contemplated that the patent laws would be given wide scope."); *id.* at 315 ("Broad general language is not necessarily ambiguous when congressional objectives require broad terms."); *Mayo*, 132 S. Ct. at 1293 ("too broad an interpretation of [the exceptions to § 101] could eviscerate patent law"); *cf. Bilski*, 130 S. Ct. at 3226 ("This Court has not indicated that the existence of these well-established exceptions gives the Judiciary *carte blanche* to impose other limitations that are inconsistent with the text and the statute's purpose and design.").

This tension is particularly problematic as to the abstract ideas exception given its unclear boundaries. *See Le Roy*, 55 U.S. at 174 (1852) ("The word principle is used by elementary writers on patent subjects, and sometimes in adjudications of courts, with such a want of precision in its application, as to mislead."); *Parker v. Flook*, 437 U.S. 584, 589 (1978) ("The line between a patentable 'process' and an unpatentable 'principle' is not always clear.").

In short, the exceptions to § 101 must be applied very narrowly to respect the language, history, and purpose of § 101, to avoid improper judicial legislation, and to account for the ambiguous scope of the judge-made exceptions, particularly the abstract ideas exception. This is especially true for issued patents since they are presumed to be valid absent clear and convincing evidence to the contrary. 35 U.S.C. § 282(a); *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2242 (2011).

C. The Court Should Not Adopt Categorical Rules Regarding § 101

This Court has consistently and deliberately avoided adopting any categorical rules regarding the scope of § 101 based on a legitimate concern that those rules might have wide-ranging and unforeseen impacts. *See Bilski*, 130 S. Ct. at 3229 ("Rather than adopting categorical rules that might have wide-ranging and unforeseen impacts, the Court resolves this case narrowly."); *cf. id.* at 3236 (Stevens, J., concurring) ("The Court . . . [has] never provide[d] a satisfying account of what constitutes an unpatentable abstract idea."). For example, in *Bilski*, this Court was asked to categorically place business method patents outside the scope of patent law. It declined to do so. *Id.* at 3228-29.

In *Diehr*, the Court was presented with claims directed to a computer-implemented method of curing synthetic rubber using a mathematical formula. 450 U.S. at 179-80. The Court could have concluded that all computer-implemented methods, or all method claims incorporating a mathematical formula, are categorically patent-ineligible. It declined to do so. Instead, the opposite conclusion was reached. *Id.* at 187 ("a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer").

In *Gottschalk v. Benson* and *Flook*, this Court found the claims-at-issue to be directed to patent-ineligible subject matter under § 101. Yet in both cases the Court quashed any doubts as to whether it was adopting any bright-line rules regarding § 101's scope. *Benson*, 409 U.S. 63, 71 (1972) ("It is said that the decision precludes a patent for any program servicing a computer. We do not so hold."); *Flook*, 437 U.S. at 590 ("a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm").

The specific issue on appeal here is "[w]hether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?" The Court should not resolve the question through the use of any bright-line rules or tests. This would represent a radical and disturbing departure from this Court's precedents. Moreover, as a matter of policy, any bright-line rule or test would almost certainly have wide-ranging, unforeseen, and potentially adverse impacts on other fields and industries. This would be true for currently patented innovations as well as innovations that have yet to be developed. A bright-line test would, at best, only provide ostensible certainty.

D. A Flexible Inquiry For Patent-Eligibility Based On Guiding Concepts and Principles Is Appropriate

Rather than adopting a categorical test or rule, this Court should articulate a flexible legal inquiry for determining patent-eligibility based on a list of non-exclusive factors drawn from this Court's precedents. *See, e.g., Phillips v. AWH Corp.*, 415 F.3d 1303, 1324 (Fed. Cir. 2005) (en banc) (instructing that "guidelines" are appropriate in situations where "there is no magic formula or catechism"). This legal inquiry should be performed on a case-by-case basis with no one factor carrying any undue weight so as to afford flexibility to both courts and the United States Patent and Trademark Office in applying the guidelines.

SHFL expresses no opinion as to the specific factors to be articulated by this Court as long as the factors are non-exclusive guidelines and equally weighed. Nonetheless, in SHFL's view, the legal inquiry ultimately adopted by this Court should expressly endorse, incorporate, or otherwise embody at least the following guiding concepts and principles.

First, it should be exceedingly rare that a duly issued patent is found to be directed to ineligible subject matter under the abstract ideas exception to § 101. Indeed, every issued patent is presumed to be valid absent clear and convincing evidence to the contrary. And as inquires regarding abstract claim qualities rarely lend themselves to clear and convincing conclusions, courts should err on the side of caution and find that patents are not directed to patent-eligible subject matter only in exceptional circumstances. This approach is supported by § 101 as a whole.

Second, the inquiry should focus on a claim's actual language *as a whole*. *See Diehr*, 450 U.S. at 188 ("It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis."). An approach that permits ignoring claim terms would, "if carried to its extreme, make all inventions unpatentable because all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious." *Id.* at 189 n.12. The inquiry should certainly *not* focus on a summary, generalization, paraphrase, or parsing of a claim.

Third, courts should require a formal claim construction before making case-dispositive decisions under § 101. Many times, an invention's definition through claim construction can clarify the invention's basic character. Thus, a claim construction may clarify the actual subject matter at stake in the litigation. Further, it may enlighten or even answer questions about subject matter abstractness. Interpreting a claim that has not been properly construed amounts to little more than interpreting a generalization of the claim.

Fourth, the inquiry should exclude any factors that involve the search for an "inventive concept" in the claim. This is consistent with the Court's repeated warnings against conflating the principles of patent eligibility with those of validity. *See Diehr*, 450 U.S. at 190 ("The question therefore of whether a particular invention is novel is wholly apart from whether the invention falls into a category of statutory subject matter.") (internal quotation marks omitted). The use of the word "inventive" also invites unnecessary confusion as to the potential definition of the term "inventive" in relation to the term "invention." *See*

CLS Bank, 717 F.3d at 1295-96 (Rader, C.J, concurring-in-part and dissenting-in-part) (describing efforts by Congress to *remove* any reference to a requirement of an "invention" with respect to patentability) (citing Giles S. Rich, *Principles of Patentability*, 28 GEO. WASH. L. REV. 393, 407 (1960) ("The drafters of the present statute did their best to take out of the law the undefinable concept of 'invention.' Whether lawyers will now take advantage of the terminology . . . and stop talking nonsense is up to them.")).

Finally, the inquiry should distinguish broad claims from claims directed to an abstract idea under § 101. Those two claim types should not be conflated. Simply because a claim's scope is broad does not mean that it is directed to an abstract idea. Indeed, a claim having extremely broad scope can still be directed to patent-eligible subject matter within the meaning of § 101, even though the claim may potentially be vulnerable to invalidity attacks.

E. As To Issued Patents, Questions Of Eligibility Should Typically Be Deferred Until Questions Of Invalidity Have Been Resolved

Aside from adopting a flexible inquiry for determining patent-eligibility, this Court should promote sensible procedural guidelines to be followed by the lower courts as to § 101 disputes. Guidance as to the proper timing of resolving § 101 disputes would be particularly helpful. In *MySpace v. GraphOn Corp.*, 672 F.3d 1250 (Fed. Cir. 2012), the Federal Circuit proposed a practical solution to the growing problem of § 101 motions being brought to the forefront of patent litigation matters. Specifically, the Federal Circuit proposed that following this Court's lead, "courts should avoid reaching for interpretations of broad provisions, such as § 101, when more specific statutes, such as §§ 102, 103, and 112, can decide the case." *Id.* at 1261. According to the Federal Circuit, following this approach will lead to greater efficiency, conserve valuable judicial resources, and help bring certainty to the courts and marketplace as to patent related disputes. *Id.* at 1260. It will also prevent § 101 claims from becoming "the next toss-in for every defendant's response to a patent infringement suit." *Id.* at 1261.

SHFL's view is that this Court should expressly endorse the approach proposed by the Federal Circuit in *MySpace*, particularly as to disputes involving the abstract ideas exception. The *MySpace* Court's warning that § 101 claims will become "the next toss-in for every defendant's response to a patent infringement suit" is becoming a reality. In fact, not only have challenges based on § 101 become almost automatic in the context of business method patents and patents involving any type of computer-implemented claims, but they are now frequently arising in other contexts involving subject matters that have long been afforded patent protection. These § 101 attacks regularly conflate arguments relating to invalidity (*e.g.*, novelty) with arguments relating to eligibility. The § 101 attacks also regularly challenge claims having broad scope as being directed to an "abstract idea" under § 101, conflating these two disparate concepts. The district courts have only added fuel to the fire through their inconsistent holdings.

What is needed now from this Court are practical solutions to the growing problems associated with the uncertain state of the law concerning § 101, particularly as applied to business method patents and computer-implemented claims. SHFL encourages this Court to adopt the practical solution to the growing problems set forth in *MySpace*.

CONCLUSION

SHFL respectfully requests that this Court reject any proposed bright-line tests relating to § 101 inquiries. Judicial wisdom compels this result. The Court should adopt a flexible inquiry that articulates non-exhaustive factors that courts and the United States Patent and Trademark Office can use to resolve § 101 inquiries. All factors articulated by this Court should be consistent with § 101's language, intent, and purpose to broadly promote the progress of science and the useful arts. Finally, this Court should expressly endorse the Federal Circuit's proposed approach to § 101 disputes set forth in *MySpace*.

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AMICUS
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IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD,
Petitioner,
v.
CLS BANK INTERNATIONAL, et al.
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

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BRIEF OF AMICUS CURIAE SIGRAM SCHINDLER BETEILIGUNGSGESELLSCHAFT mbH, IN SUPPORT OF NEITHER PARTY

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*) see: www.FSTP-Expert-System.com

STATEMENT OF IDENTITY AND INTEREST

Sigram Schindler Beteiligungsgesellschaft mbH and its subsidiaries (collectively "SSBG") are research-based high technology companies located in Berlin, Germany, developing and selling products also in the US, primarily via TELES AG. SSBG is a majority shareholder of TELES AG, founded 1983 by Sigram Schindler[1].

SSBG's business is dependent upon patent protection, in particular in the United States and Europe. Strong patent systems require that the patents issued are consistently interpreted. Thus, SSGB has a vested interest in supporting the US patent system in its on-going development in adjusting itself to the needs of the emerging technologies. This Court indicated by its groundbreaking *KSR/Bilski/Mayo* decisions what these needs are and how it requires meeting them by precedents as to 35 USC §§ 101/102/103/112. This Amicus Brief aims at supporting this development by showing that these Supreme Court requirements provided to US SPL precedents an Advanced IT basis facilitating it.

This brief, in support of neither party, is filed on behalf of *Amicus Curiae* SSBG – which has no financial interest in either side.

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[1] Pursuant to Supreme Court Rule 37.6, amicus curiae states, that no counsel for a party authored this brief in whole or in part, and no entity or person other than amicus curiae, its members, and its counsel, made any monetary contribution toward the preparation or submission of this brief. Both parties have provided blanket consent to the filing of Amicus Briefs.

SUMMARY OF THE ARGUMENTS

The question presented by the Supreme Court to be answered by this Amicus Brief asks

"Whether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture–are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101, as interpreted by this Court"

The primary issue of this question thus is, what properties of a computer-implemented invention ("CII") make it being patent-eligible or non-patent-eligible subject matter[2]. This brief leverages on the *Mayo* decision's clear requirement to identify these properties of a claimed invention by its "inventive concepts" – as the first step in construing its claim construction – and to determine its patent-eligibility by them. In *Mayo* these requirements are focused on pharmaceutical subject matter, though its reasoning applies to any invention, also all "model based" ones, i.e. to all emerging technology inventions' tests under § 101, such as to CIIs.

The *Mayo* requirements also bring Substantive Patent Law ("SPL") precedents into line with Advanced IT [2-4]. Nevertheless, the merits of *Mayo,* also as to the above question, still are difficult to appreciate by many US patent practitioners.

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[2] A side issue this question asks for is, why distinguishing, as to CIIs' patent-eligibility, between CII incarnations being systems and machines resp. processes resp. items of manufacture. This brief's elaborations logically imply: There is no scientific rationale for such a distinction.

Hence, this Amicus Brief explains once more [e.g. 18,19], now by practical examples, why the Supreme Court by *Mayo* had to require that testing a claimed invention for patent-eligibility – e.g. a CII – indispensably must construe its claim construction and the latter must be significantly finer than the classical *Markman/Phillips/KSR* claim construction.

Mayo thus

- took US patent precedents to a level of development enabling predictable and consistent patent precedents for all claimed inventions, i.e.
- has established a guidepost as to interpreting US SPL for claimed emerging technology inventions.

Mayo namely logically implies: As to a claimed invention's (computer-implemented or not) § 101 test – hence also its §§ 102/103 test – there are two sources of potentially disastrous failures:

I.) Not to start it (or said §§ 102/103 test) by construing for it its § 112 claim construction, or

II.) not to refine this § 112 claim construction as *Mayo* requires – a failure increased if also the USPTO's "Broadest Reasonable Interpretation, BRI" guideline [14] is applied, thus not refining but coarsening this § 112 claim construction.

Note: The result of this § 112 test evidently decisively impacts on its §§ 101/102/ 103 tests.

Mayo thus enormously improved the quality of US SPL precedents – by its forcible exclusion of these 3 test failures by its procedural requirement.

Leveraging on *Mayo*, the CONCLUSION then answers the Court's question not only for CIIs but also for all model based inventions, and not only for testing them under § 101 but also under §§ 102/103.

ARGUMENTS

I. SUMMARY OF SSBG'S BRIEFS AS TO SPL TESTING OF CLAIMED INVENTIONS

By its *Mayo* decision this Court has decided that a claimed invention – e.g. a CII – is patent-eligible if and only if it meets two requirements: It

- embodies at least one patent-eligible "inventive concept", i.e. is not a natural phenomenon, and
- is not an "abstract idea" only.

These two requirements' key terms/notions[3)] – marked-up by quotation marks and irrelevant in SPL precedents prior to *Bilski/Mayo* – were not really self-explaining when used by these Supreme Court decisions. Hence, their explanations has been provided by SSBG's two Amicus Briefs to this Court as to this § 101 question [18,19]. These explanations showed that the new terms/notions "inventive concept" and "abstract idea" precisely concur not only with Highest Courts' SPL precedents, but also with the well known peer terms/notions in Advanced IT [2-4], "concepts" and "well-foundedness" – enabling mathematical KR modelling of SPL precedents.

The next two bullet points summarize basics of these new terms/notions, which *Mayo* requires to be used in a claimed invention's § 101 test [18,19].

Before recapitulating these basics: Clarifying these two *Mayo* terms/notions is not the focus of this Amicus Brief – as it was in SSBG's two preceding Amicus Briefs [18,19] – but firstly •) to answer the above question of the Supreme Court in a way indisputable from the SPL precedents as well as from the Advanced IT/Mathematics points of view, and secondly •) also to show that meeting these *Mayo* requirements equally eliminates the identical problems with an invention's test under §§ 102/103, arising from its committing an above failure **I.)** / **II.)**.

This undisputable answer is achieved by this Amicus Brief, in the light of the *Mayo* decision, as follows. After the just mentioned short recapitulation of basics of these two new *Mayo* terms/notions, Section II will show that even if a § 101/102/103 test were properly started by a classical claim construction – which is not the case in Sections III and IV, as they totally ignore resp. only mention claim construction – the BRI may cause confusion additional to the confusion resulting from the classical claim construction performing too few and too sloppy tests [19,25]. Sections III and IV then demonstrate what the consequence may be if the failure **I.)** resp. **II.)** is committed when running, for a claimed invention, one of the 3 §§ 101/102/103 tests – in particular if the claimed invention is model-based, e.g. is a CII.

Now to the basics of the two new *Mayo* terms:

- **The *Mayo* Term "Inventive Concept"**. The 1. Amicus Brief [18] primarily explains the legal advantages of inventive concepts in terms of the usefulness requirement stated by the § 101, which comes along with the notion of this new term[3)] and the SPL paradigm refinement it represents. Inventive concepts, as understood by *Mayo*[3)-6)] (see also [6], ftn 4), are the incremental units of the claimed invention's total usefulness. Separating them from each other – i.e. by disaggregating the compound inventive concepts of the elements of the claimed invention into their respective conjunctions of independent of each other elementary inventive concepts – enables separating, for any claimed invention, its patent-eligible from its non-patent-eligible elementary inventive concepts. This fundamental *Mayo's* requirement is to be met by any claimed invention's claim construction.

Thus, this Amicus Brief explained that and why determining a claimed invention's inventive concepts, as the first step in construing the claim construction for it as required by *Mayo*, enforces an increase of its conciseness and coherence (see also the summary of the 2. Amicus Brief below),

At its beginning, the 1. Amicus Brief also explained, why this increased conciseness and coherence is indispensable for SPL tests of model based claimed inventions (including their §§ 101/102/103 tests), as these always deal with at least partially intangible/invisible subject matter of emerging technologies, also holding for CIIs.

- The *Bilski/Mayo* Term "Abstract Idea". The 2. Amicus Brief [19] primarily explained, on top the just said, that achieving consistency in SPL precedents is impossible unless granting preemptive patents is avoided and that this requires separating also the 10 elementary SPL concerns – in their logical conjunction making up the 4 compound SPL concerns defined by the 4 §§ 101/102/103/112 – from each other and testing a claimed invention whether it satisfies all 10 of them, which in particular implies testing the claimed invention by its elementary inventive concepts for its being nonpreemptive.

Consequently, by its end, this 2. Amicus Brief also finishes with the unreasonable discussion of the term/notion "abstract idea", in spite of its reasonable use in *Bilski/Mayo*[3)-6)] – although sometimes puzzling, admittedly, due to brevity.

In a claimed invention's patent-eligibility test, of these two new *Bilski/Mayo* terms/notions – "inventive concept" representing its increments of usefulness, and "not [being] an abstract idea only" representing its global well-foundedness – the

- first one excludes the problem primarily causing the above question about it, i.e. excludes committing the above failures **I.)** and **II.)**, and the
- second one often enables deciding, by the NAIO test, its being well-founded or not (see below).

The exclusion of the failures **I.)** and **II.)** is necessary for the dependable answer to the Supreme Court's above question. The well-foundedness of a claimed invention (decidable only after the first step(s) of construing its *Mayo* conforming claim construction) is sufficient for its patent-eligibility, but achievable only in specific cases, e.g. for most CIIs.

This takes US SPL precedent to a higher level, as Sections III/IV show: Each CII therein individually •) determines by its "inventive concepts" its right basis for indisputably testing it under § 101/102/103 (tentatively ignoring them [25]), and •) passes its "not an abstract idea only, NAIO" test and hence is here nonpreemptive, i.e. patent-eligible.

The first *Mayo* term/notion is politically simpler than its "problem-solution" borne well-foundedness/"not-an-abstract-idea", with US patent experts suffering an "EPC stigma" (see the end of Section II).

II. THE BRI GUIDELINE CONTRADICTS THE HIGHEST COURT'S PRECEDENTS IN THE *PHILLIPS* AND *MAYO* CASES

Section I summarized that this Court took by its *Mayo* decision SPL precedents to a higher level of development and thus accommodates robust patenting emerging technology inventions. I.e., *Mayo*

α) confirms – by explicitly requiring to identify the "inventive concepts" representing the claimed invention's (potentially) patentable usefulness increments – what already *Phillips* has required by: "*The inquiry into how a person of ordinary skill ... understands a* ***claim term***[3] *provides an objective baseline from which to begin claim interpretation*".

This "***Phillips*** **opening statement**" – to first "*provide* ***AN*** [i.e. single] *objective baseline from which to begin claim interpretation*" – is often ignored, though different "baselines" or none at all may cause incoherent claim interpretations (see **i)**).

β) additionally requires to ensure by this "inventive concepts baseline" that the claimed invention resp. its claim is •) nonpreemptive (i.e. not an abstract idea only [5]), •) not non-patent-eligible (i.e. comprises at least one patent-eligible inventive concept), and •) patentable (i.e. its patent-eligible inventive concepts indicate it deserves patentability), as explained by Amicus Brief [19] and [25].

I.e.: Already by *Phillips* – amplified by *Mayo,* as of α) and β) – SPL precedents requires a claimed invention (when testing it for satisfying SPL), e.g. a CII, to be more carefully checked, i.e. to undergo more tests, than for construing for it (especially by BRI) the classical claim construction [25].

Thus, as explained by the end of this Section: The refined *Phillips/*post-*Mayo* claim construction is, compared to the classical/BRI one – especially for model based inventions – legally dramatically more

- **concise**, by first focusing on its inventive concepts disclosing its by § 101 required novelty and usefulness increments – so excluding legally misleading technical meanings of its claim's terms3)-6) – and
- **coherent**, by ensuring its § 112, its § 101, and its §§ 102/103 aspects are all "well-founded" [5, 25]3).

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[3] *Mayo* uses the term "inventive concept" only three times and often omits/replaces it by other terms, e.g. in "*... do the patent claims add enough* <inventive concepts> *to ....*", or "*... unless the process has additional features* <alias: inventive concepts> *that ...*", or "*What else* <inventive concept> *is there ...*", or "*Those steps* <alias: inventive concepts> *included ...*". This tells: An invention's specification may embody inventive concepts by synonyms or even only implicitly.

A term together with its meaning is a "notion". A notion hence defines its term's meaning. In *Mayo* a notion is called an "inventive concept"4), if its meaning has the pragmatics to serve for defining the claimed invention's "§ 101 usefulness", this pragmatics being disclosed by the claimed invention's specification (unless known a priori by the person of ordinary skill and creativity). A notion – e.g. "inventive concept" – may be represented by different terms (= synonyms), as the preceding paragraph exemplifies.

In the above *Phillips* opening statement, the "claim term" is a "claim's term" representing an inventive concept3). Other "claim's terms", not having that pragmatics, are no inventive concepts. The *Phillips* decision deals only with claim terms3) alias inventive concepts. For convenience it mostly leaves away the

These clarifications added by *Mayo* to claim interpretation unfortunately did not yet make it into the often quoted – massively questioned [21,37] – USPTO's "Broadest Reasonable Interpretation, BRI" guideline [14], originating pre *Phillips*. The BRI thus maintains its legal errors causing insinuation that some volitionally broadening of the meanings of claim terms were lawful (as practiced by the PTO, see Section IV) – although *Phillips* and now also *Mayo* require the contrary (while there is no US law supporting this BRI guideline, which might render these then unavoidable contradictions lawful). I.e.: Consistency and predictability of SPL precedents is impossible to achieve, if the BRI guideline remains as it is and used by courts as SPL precedents – what it definitively not is – as this Section's end explains.

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leading "claim". But not in its opening statement, i.e. its "baseline" statement in a) and below in i).

Just for information: A term in a claim may represent two different meanings, one meaning with and the other meaning without inventive concept pragmatics; it then can be seen as a claim term or as a plain claim's term. I.e., in claim interpretation its latter meaning is "contra *Phillips/Mayo*", hence there legally inadmissible.

The BRI guideline ignores this distinction and thus is often legally misleading. It thus insinuates that a claim's term always is a claim term. This unreasonably broadens the meanings of the claim terms (see Sections III/IV). *Mayo* bars this terminological "glitch" by introducing the term "inventive concept" as synonym to *Phillips'* "claim term". For "inventive concept" being legal items – not just factual ones – see [5,7,11,36].

The paragraphs i)-iv) elaborate on further – already pre-*Mayo* existing – contradictions between the just described guidance provided by BRI and *Phillips*. [37] provides more fundamental BRI critics.

i) The BRI guideline starts its legal opinion by quoting, in its "**BRI opening statement**" – as to the general requirement of determining a claim term's meaning by the claimed invention's specification – a statement from the *Phillips* decision in a misleading way[3)-6)]. It "*requires that ... .) claims must 'conform to the invention as set forth in ... the specification and the :) terms ... in the claims ... so that the meanings of the terms in the claims*......". The second part of this quotation is misleading as it talks of "... *the meanings of the terms in the claims* ...", i.e. of volitionally stretchable meanings[3)-6)] of "claim's terms", not about "claim terms' meaning".

This is a misrepresentation of the *Phillips* decision, as it made this BRI opening statement

•) only after it had repeatedly explicitly required to exclude such "free-style" term interpretations independent of the claimed invention. I.e.: By the *Phillips* opening statement "claim terms' meanings" must result from tying these terms' interpretations tightly to the claimed invention, i.e. must not contradict it (see Section IV) – as confirmed by *Mayo*[3)-6)] – and

•) when it was considering the aspect of heavy use of the specification in claim interpretation. *Phillips* made this statement as to "It is ... appropriate ..., when conduction claim construction, to rely heavily on the written description for guidance to the meaning of the claims" – which evidently in no way relaxes the above quoted "baseline" requirement tying claim terms' meanings tightly to the claimed invention's meaning.

ii) Another – quite similar – up-front deficiency of the BRI guideline is that the USPTO ignored the fundamental *Phillips* opening statement (quoted in a)) and choose for its BRI guideline the just explained BRI opening statement, which insinuates a claim's terms need not be subject to the much tighter limitations imposed on them by the *Phillips* opening statement. This may be even disabling the limitations of the claimed invention, as parts of the description without any relation to the claimed invention may also support claim terms and mislead the claim interpretation definitively away from the claimed invention – in spite of its being clearly described by the specification (see Section IV).

iii) Immediately after its BRI opening statement, the BRI guideline starts encouraging all the old confusions about claim interpretation – perhaps disappointed by the CAFC's *Phillips* ruling, as it refines the *Markman* rulings but offers no simple tests (which by [25] don't exist) – by referring to a series of 5 pre-*Phillips* decisions (going back to 1969) and confronting the reader again with the at that time occasionally murky claim interpretation, which to prevent for the future has been the main purpose of the *Phillips* decision – and now is also of the *Mayo* decision! It thereby indeed becomes "obscure" [21] by quoting from these very early decisions a mysterious sentence, forbidding: "*... thereby [to] narrow the scope of* *the claim by implicitly adding disclosed limitations which have no express basis in the claim*". Though its underlined wording is indefinable3)-6), it insinuates the lawfulness of pre-*Phillips* feelings about claim interpretation, which contradict the clean/rational ruling of *Phillips*. It thus flushes the clarification provided by *Phillips* – as it thus reestablishes the murkiness of pre-*Markman/ Phillips* claim interpretation.

iv) Removing uncertainties caused by the BRI guideline requires also addressing another broad and surprising statement therein. It quotes the CAFC: "*The court held that the PTO is not required, in the course of prosecution, to interpret claims in applications in the same manner as a court would interpret claims in an infringement suit.*". While this quotation insinuates it were quite generally applicable, the CAFC seemingly has not intended it to be so understood. The BRI guideline namely continues quoting the CAFC: "*PTO applies to verbiage of the proposed claims the broadest reasonable meaning ....*". The CAFC thus rather intended it to be used by the USPTO only for clarifying claims being "*verbiage*"4).

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[4] A patent specification may disclose several inventions. A first consequence is that a claim seeking patent protection for one of them must identify which one. This one then is called this claim's "claimed invention".

While this need to focus on a claim's "claimed invention" was recognized long time ago, it is only *Phillips* that recognized the second consequence. Namely, to focus in a claim's interpretation on interpreting its "claim terms"2) only – just as on its "clamed i)-iv) are delicate: The *Phillips* decision does comment on the above BRI opening statement and thereby clearly states that the PTO itself introduced the BRI into this discourse, not the CAFC.

The above elaborations on the BRI intended to show only that claim construction requires – because of its pitfalls especially with model based claimed inventions – much more problem awareness and scrutiny than the current BRI guideline embodies. Since *Mayo* – α) and β) quote its requirements – this is untenable. *Mayo* namely clearly

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invention". To this end *Phillips* calls such terms "claim terms" – see its "opening statement" quoted above and several more places in its decision – though it often skips the leading "claim", probably by evidence. *Markman* did not yet address this intricacy in claim construction, i.e. nowhere talks of "claim terms", i.e. ignores that a claim interpretation may need being thus focused – fixed by the *Phillips* decision by explicitly complementing a quoted *Markman's* "term" to become a "[claim] term".

Note: There are 4 situations covered ex- and/or implicitly by *Markman/Phillips* and implied by *Mayo* requiring deriving the meaning of a term in this "claimed invention focused way" from the specification (i.e. as indispensable for the functioning of the claimed invention): This claim term may be ex- or implicit to its claim's wording and its claimed invention's meaning may also be ex- or implicit to its specification.

The USPTO's BRI does not only just ignore *Phillips/Mayo* – but also encouraged the PTO's BPAI to legally totally overstretch a claim terms' meanings and hence interpret this claim's meaning to contradict its specification – without noticing it (shown in IV).

finishes5) with the misbelief that the meanings of a claim's terms are derivable alone from this claim's wording. The BRI doesn't care – just as many patent experts, even judges – and insist in this misbelief and practice it incredible broadly (as demonstrated in Section IV). I.e., they simply ignore *Mayo* – as its inventive concepts definitively bar this misbelief5),6) – and frankly assert that *Mayo* had nothing to do with claim construction [38]6).

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[5] As to this misbelief, linguists hint at sentences like "John sees Jim with his binoculars on the mountain": Therein the terms "sees" and "his" have no unique meanings. Without knowing the meaning of this sentence a priori, the meanings of its terms are not uniquely determinable. I.e.: By Advanced IT, the meanings of the terms in a sentence may be uniquely determinable only, if the meaning of the sentence is known.

Consequently, it was inevitable that *Phillips/Mayo* required that in claim interpretation the claimed invention's meaning, its "technical teaching", is known before determining the meanings therein of the claim's terms. I.e.: Patent judges/lawyers/examiners must precisely understand the claimed invention prior to beginning determining the meanings therein of the claim's terms. Sections III / IV show topical counterexamples.

[6] The mathematical definition of the notion "inventive concept" alias "claim term"3),4), as discussed in more detail earlier [5-11], is a dramatic simplification of the powerful notion of "concept" in DL or KR [2-4], as it here is customized to modeling SPL precedents, nothing else, i.e. only FOL predicates of constants, the elements of the claimed invention. In DL or KR, concepts serve for modeling how to recursively build compound concepts out of simpler ones.

By contrast, the Highest Courts' SPL precedents proceeds the opposite way: Modeling it, in particular

In total: The BRI contradicts *Philips/Mayo* by ignoring their much more concise claim constructions. Instead, it clings to the "classical"/*Yamamoto* one, proven by *KSR/Bilski/Mayo* to be deficient for model based claimed inventions. It thus causes huge

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modeling the properties of the elements of a claimed invention, needs only the disaggregation of compound inventive concepts (which model compound such properties of the elements) into elementary inventive concepts (which model elementary such properties of the elements) [5-11]. And by § 112 any elementary such property of an element must be clearly defined. By trivial logic this means: This elementary property of this element must be describable by a mapping of its elementary concept's universe onto <T,F>, thus (by its truth set) precisely describing this elementary property of this element.

The so resulting conjunction of elementary properties of this element (of the claimed invention) may be created by a man – which by § 112 must be disclosed in an enabling manner – or by a natural phenomenon. If none of both options applies, then this inventive concept of the claimed invention does not meet the § 112 requirements – an "abstract idea" of an element's property disables describing it precisely. I.e., any set of elementary inventive concepts that allegedly defines the (meaning of the) claimed invention does pass its test under § 112 if and only if any element of this set is an inventive concept of one of these two kinds. Thus: A claimed invention cannot pass its test under § 112 (and §§ 101/102/103 [19,25]) unless it is made up from inventive concepts of one of both kinds – already testing a claimed invention under § 112 as required by *Mayo* excludes inventive concepts being "an abstract idea only). This clarification is crucial for understanding Subsection III.2.

discrepancies when getting, in construing for a claimed invention its claim construction, to testing it under § 101/102/103. This massive deficiency of classical claim construction is reemphasized, next.

Construing, for a claimed invention, a

- refined claim construction by means of testing it under §§ 112/101/102/103 yields a construction satisfying SPL, while construing for it just a
- classical claim construction by means of testing it under § 112 only yields a construction satisfying SPL or not. I.e., of this construction still must be shown that its claimed invention (for which it is supposed to stand) does pass also the other 3 tests or not. The crucial point in proceeding this way is that these 4 tests are not separable from each other, as shown earlier [19,25]. Thus this classical construction may have to undergo significant changes for enabling deciding whether it passes these 3 tests. This need to go back to its § 112 test [19,25] may easily be forgotten and then may render these 3 remaining tests faulty, and hence the claimed inventions whole SPL test7).

We conclude this Section II with critics on the BRI (based on SPL precedents, [11,37] base them on the Constitution) and on classical claim construction by a preview on Sections III and IV. They both show

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[7] In none of these decisions the Supreme Court explicitly addresses this deficiency of classical claim construction. But, it is not its business to fix in detail such a problem, once it had indicated it – by ignoring it, in *Mayo,* and instead showing what a legally correct claim construction is, by refining the CAFC's *Phillips* decision and clearly stating its claim construction requirements.

that claim construction taken easy – as of I.) or II.) in the above SUMMARY – is disastrous. Both Sections prove that sloppy claim construction may irreconcilably derail CIIs' SPL tests: Section III deals with totally skipping it and hence completely ignoring the *Philips/Mayo* requirements, Section IV with only partially skipping it and using the BRI.

Sections III and IV thereby exemplify that this sloppiness as to claim construction is broadly practiced – though intellectually it is just a painfulness and hence practically often produces nonsense.

- Section III shows, how such legal sloppiness managed to cause the clash at the CAFC about patent-eligibility testing of the CII in the CLS case. Namely: By totally skipping claim construction and hence completely ignoring the *Phillips/ Mayo* requirements that would have avoided it, if the CAFC had proceeded according to them.
- Section IV shows to which incredible extent the BRI allegedly entitles the forcible broadening of the meanings of a claim's terms – why its two cases are included into this Amicus Brief, although they deal with a CII's §§ 102/103 tests, not its § 101 test. In this case this BRI based broadening of claim terms even implies that, for the posc, the so BRI modified CII has nothing to do with what its specification repeatedly and unmistakably discloses as its CII, i.e. diametrically contradicts the specification.

Both bullet points together have lead already earlier the community of patent experts into similar debacles as in the CAFC, namely as to this Court's *KSR/Bilski/Mayo* decisions. I.e.: This ubiquitous sloppiness as to claim construction steadily undermines the understanding that they all require a concise and coherent claim construction, overcoming the evident deficiencies of the classical one [25]7).

This Amicus Brief does not allege that all problems of SPL precedents would disappear when claim construction were performed as required by *Phillips/Mayo*, in particular the BRI guideline would be fixed accordingly. As a matter of fact, Advanced IT research [5,25] shows that there are several serious problems ahead in applying for emerging technology patents and drafting them such that their claim constructions would be "Highest Courts proof". Some such problems are in principle already hinted at by the Supreme Court's above decisions, though they practically have not yet been noticed by SPL precedents – what definitively will happen – and which to handle the latter is not yet prepared for.

But, without finishing with this sloppiness as to claim construction and in particular removing BRI's current legally misleading insinuations – both evidently very persuasive – it will be impossible to find firm ground for resolving the problems ahead of SPL precedents for emerging technology inventions, even those identified already by the *KSR/Bilski/Mayo/Myriad* decisions.

Note: Such increases in sophistication – as here discussed – are unavoidable during maturing of scientific disciplines, here of SPL precedents, currently undergoing partial scientification. They/It reflect/s that the rationality in SPL precedents increases, the objective truth embodied by SPL precedents is growing – and in these parts is no longer subject of change by political winds [16], as the history since the Enlightenment teaches.

III. ADULTERATING CIIs' SPL TESTS BY SKIPPING THE CLAIM CONSTRUCTION

The preceding paragraphs explained the demonstrative purpose of this Section III: To show what skew and controversial discussions can arise, if arguing about a claimed CII's § 101 test is started prior to establishing clarity about the claim terms' meanings of this CII3),4), i.e. prior to testing the CII under § 112 the *Mayo* conforming way. That even then executing the § 101 test would still require that the CII is of FFOL, has not even been noticed by SPL precedents, and is explained below.

This subsequent demonstration uses the *CLS* case (*CLS vs. Alice*) and deals with Alice's exemplary patent '479 and an exemplary claim (e.g. claim 33) identified in the first opinion in this case. This is the only '479 CII alias Alice CII considered in the sequel.

Subsection III.1 first outlines, which inventive concepts make up this Alice CII. By *Mayo*, determining these inventive concepts must be performed, first – in construing for Alice CII its refined claim construction – as they determine the meanings of the claim terms of the claim claiming Alice CII3),4). Subsection III.1 also outlines the blueprint of what *Mayo* requires as claim construction in this case.

By a passage in its largest opinion Subsection III.2 then explains, why this opinion's thinking is far away from a *Philips/Mayo* conforming § 101 test of a CII – it logically actually contradicts.

The here shown adulterating of the '479 CIIs' SPL test due to skipping the claim construction for it holds for also the other CIIs' § 101 tests at issue, in *Ultramercial vs. Hulu* and *Accenture vs. Guidewire.*

III.1 The inventive concepts of the Alice CII and its *Mayo* conforming § 101 test

The meaning of the '479 CII is not controversial and clearly described by the specification.

This '479 CII's compound meaning (alias the technical teaching) of the '479 CII is made-up from the meanings of the '479 claim terms, i.e. from this CII's elementary inventive concepts[3),4)]. These must be identified/defined according to the *Phillips/Mayo* requirements – what happened already in the preceding Amicus Briefs in this case [18,42], are next quoted from there, and cannot here become elaborated on to a higher degree of detail, as this then would make this Amicus Brief represent Alice.

Quoting from [42], the 7 elementary inventive concepts (**"in-Cs"**) of the '479 invention are the in-Cs: •) "shadow", •) "start of the day balance", •) "transaction based adjustment", •) "chronological adjustment", •) "end-of-the day reflect adjustment", •) "irrevocable time invariant obligations", and •) "ultimate exchange of obligations".

Evidently none of the in-Cs represents a natural phenomenon. But, anyone represents a fully by men created thought, which incrementally contributes to the '479 invention's total § 101 usefulness [18].

Assuming this set of elementary in-Cs passes all other § 112 tests (for what this exactly means see [25]), the necessary patent-eligibility condition for the '479 CII is fulfilled (see I. at the end of Section I).

The there also quoted sufficient condition II. for the CII to be patent-eligible – the CII passing the NAIO test [19] – is equally fulfilled, as

- the above consensus about the meaning of the '479 CII here also comprises that the problem it solves is clearly defined by its specification, and
- one immediately sees that this problem actually
    - is solved by the *Alice* CII, as it is of FFOL. Thereby a CII being of "Finite First Order Logic" means that
        - ❖ only finitely many in-Cs make-up the CII (i.e. only a finite number of claim terms of the claim claiming the CII, each claim term having a unique meaning determined as required by *Phillips/Mayo*3),4)), and
        - ❖ the set of these in-Cs is of FOL.
    - cannot be solved if one of the above 7 in-Cs is left away.

The claimed '479 CII hence passes the NAIO test, i.e. it is not an abstract idea only. By [5,25] this is sufficient for its being non-preemptive, i.e. for its being patent-eligible, as meeting *Mayo's* requirements8).

III.2 A Scholastic View at a Claimed Invention's "Inventive Concepts", "Being an Abstract Idea", and "*Mayo* conforming § 101 test"

The subsequent discussion of the scholastic view at *Mayo* by the largest opinion in this case – evidently irreconcilable with the hitherto by this Amicus Brief represented enlightened view at Mayo, as it seeming also is shared in part by dissenting opinions8) – shall facilitate getting acquainted with this increased enlightenment coming into SPL precedents along with the two *Mayo* key terms/notions discussed above: Once this getting acquainted with these rationality/scientification driven terms/notions has happened, one immediately sees that they both are next to trivial, anyway self-evident[8]. Just as riding a bike and swimming is trivial/self-evident, once one got acquainted to it. The only difference actually is that bikes and water are tangible/visible, while model based inventions, i.e. also CIIs, are vastly intangible/invisible – and hence require an increased amount of rationality/scientification.

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[8] This Subsection III.2 explains why the CAFC's clash has been predictable and actually has been predicted [44], though not in the intensity and frequency as it then actually occurred. SSBG's position already then was that *Mayo*, with its "inventive concepts" approach to the patent-eligibility issue had shown the way how to separate patent-eligible from non-patent-eligible inventive concepts – namely by first disaggregation a claimed invention's compound inventive concepts into their elementary independent ones – and hinted at serious conflicts such simple truths may embody, e.g. the old Greeks' reluctance to accept that a refinement of the then rational number system is indispensable for integrating e.g. the theorem of Pythagoras into it.

I.e.: This CAFC clash just reproduces a natural phenomenon occurring in any cultural confrontation, here the confrontation of established SPL precedents thinking and a SPL customization of established KR/Mathematics thinking: Achieving an appreciation by one culture of the other culture's thinking takes much more time than logically justified. One reason may be the usual mutual unwillingness to elaborate on such an appreciation. But the fundamental reason has been observed since long time and has to do with what today is often called "knowledge recognition problem", as represented by Shannon's famous "natural number knowledge" test performed by English speaking Martians on English speaking Terrestrials. Overcoming such a problem may last years, unless a White Knight somehow interferes. Here it would have sufficed, if construing a *Mayo* conforming claim construction had been tried for the claimed '479 invention, as demanded by the Supreme Court. But, at CLS's *En Banc* hearing [39], this key question was no issue.

This view applies most deserving scholastic metaphysics thinking – for thousands of years it has been the basis of culture and civilization. Yet, though rhetorically just excellent, this view did not manage to escape the classical "scholastic metaphysics trap" to believe that earlier thinking about an issue's meaning has already made its way into the natural language, and hence this issue's precise meaning may be derived from its description in natural language, i.e. is sufficiently subtle and hence needs no rationality based refinement – although the issue terms' meanings are not quite clear, normally simply ignoring this.

I.e.: This scholastic thinking has two serious deficiencies. •) Scientifically it is untenable, as it is founded on the misbelief that the meanings of terms used in arguing – here of the two new *Mayo* terms – can be derived from sentences using them, as explained earlier5) and elaborated on below. •) Socially it is infeasible here, as it is known not to be supportive as to unfolding the socially and/or economically creative potentials of a free society, in particular not of emerging technologies.

The second aspect is one of the main objectives of the patent system, as this Court reemphasized in *Mayo*, and hence repeatedly rejected structuring SPL precedents such as to fix some problems in the past at the cost of hampering the future.

The first aspect of this opinion's view on *Mayo* is disclosed in "*An Integrated Approach to § 101*", on p. 21-22, when drawing conclusions from its preceding elaborations on *Mayo*,

> ***"Analyzing patent-eligibility ... considers 'whether steps combined with a[n] natural law or abstract idea .... yield a claim that effectively covers the natural law or abstract idea itself'".***

without noticing that the underlined terms' meanings in this conclusion are totally undefined.

In particular, it is unclear how •) to combine – what does "combine" mean? – "steps", in *Mayo* being inventive concepts alike, with an "abstract idea (itself?)", in *Bilski/Mayo* standing for an incompletely described invention, just as •) to effectively cover – what does " effectively cover" mean? – an "abstract idea itself", whereby *Bilski/Mayo* did not use the term/notion "abstract idea itself", at all.

And it is totally unclear how this thinking should ever help to achieve the exclusion of the § 112 test problems I. and II. explained by the SUMMARY.

In spite of these open questions – due to this opinion's pre-scientific approach to clarifying the meanings of the two new *Mayo* terms3),4) "inventive concept" of a claimed invention and its claimed invention's "(non)-preemptiveness" alias being "(not) an abstract idea only" – its view logically implies a "NO" to the Supreme Court's question. But, this opinion provides no rational justification for this view, and its scholastic one is not helpful. Though, it enjoys superb congeniality of souls: The colour theory of Goethe encountered the same fate.

IV. ADULTERATING CIIs' SPL TESTS BY BRI

The preview on Section IV, provided by the end of Section II, promised demonstrating by practical/topical examples that also the BRI's free-style claim construction may have disastrous impacts on testing a CII for its satisfying SPL. Accordingly, this Section shows that the BRI guideline allegedly invites disregarding *Mayo* in CIIs' §§ 102/103 tests (which repeatedly state to be based on the BRI).

The 4 CIIs here at issue(4) are disclosed by claims 68 resp. 91/104 of the '902 patent of SSBG/TELES (US 7,145,902) resp. by claim 35 of its '453 patent (US 6,954,453) and are subject to §§ 102/103 attacks by the USPTO(9) and CISCO.

All claimed CIIs deal with Internet telephony, today called VoIP (VoIP = "voice over Internet Protocol", a term not existing at the '902/'453 priority date, 1995) and thereof with a technically then totally novel version, today broadly used.

The basic CIIs claimed by claims 68 and 35 solved the then frequently occurring problems that

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[9] The USPTO itself has problems with the BRI. In full knowledge of the CRU's and BPAI's BRI based opinions that the CII claims at issue – e.g. the just quoted ones – are not patentable, the responsible USPTO's Examiners issued recently 3 more CIP patents, i.e. based on the identical specification and the identical inventive concepts (just adding some mobility features disclosed by the '902/'453 specification a priori), in spite of these inventive concepts here being allegedly not sufficing for their patentability, due to the BRI. I.e.: The Examiners disregarded this BRI invitation.

the quality of a telephone call over a packet-switching network, e.g. the Internet, was unacceptably low due to signal propagation time between the telephone sets unexpectedly rising above the threshold for telephony, known to be 0.5 sec. The compound inventive concept common to anyone of these claimed CIIs – it is the logical conjunction of anyone of these CIIs' elementary inventive concepts required by Mayo, common to both CIIs – is to route the call on both telephone sites over a switch, which monitor the "communications connection" between the telephone sets and, as soon as this monitoring detects only a potential problem therein, to react by changing-over with this call by the calling switch onto a PSTN connection (PSTN = public switched telephone network) between them without interrupting the call. This avoids, in both CIIs, that the potential problem may occur – though it might not have occurred, anyway.

These are the claimed CIIs, from which *Mayo* requires to derive the meanings of the claim 68 / 34 claim terms[3),4)]. Let us focus on the claim 68, first.

The free-style claim term interpretation by the BRI enables volitionally broadening the meanings of these claim 68 claim terms[3),4)] as follows:

- While the claimed CII of claim 68 is by its specification made-up from (1) a telephone call (by the posc known to be a **communications connection**), and therein (2) a totally novel control signal ("**pro-active signal**") triggering the telephone call's (3) change-over (being a **real-time change-over**) from (4) an **arbitrary** packet- to an **arbitrary** line-switching network,

- the BRI completely ignores all these highlighted meanings of these 4 claim 68 claim terms[3),4)] alias inventive concepts of its claimed invention, although the limitations of these meanings are necessary for the claimed invention's working and disclosed in detail by its specification.

  I.e.: Instead of determining these 4 claim 68 claim terms' meanings[3),4)] as required by the claimed CII's working (disclosed in detail by its specification), the BRI determines these claim terms' meanings totally independently of the claimed claim 68 CII. I.e., the BRI refuses to accept that the "*Phillips* baseline" just as *Majo* clearly require to take the 4 claim 68 claim terms' meanings[3),4)] ("pre-limited", as compared to the meanings the posc would determine for these terms by their BRI). I.e.: The BRI insinuates proceeding this way, even if these broad meanings •) are clearly excluded by the specification supporting the claim at issue, and •) modify the claimed CII such that it evidently does not resolve the problem specified by the specification, for the solution of which the CII has been invented.

By contrast, determining these 4 claim 68 claim terms' meanings within the framework of the '902 specification inclusively claim 68, as required by *Phillips/Mayo,* shows that **NONE** of these 4 inventive concepts ("**in-Cs**") of the CII claimed by claim 68 is disclosed by anyone of the 4 prior art documents.

(1) The in-C "**communications connection**".

  The BRI allegedly encourages asserting that a "telephone call" (being a "communications connection") can be achieved by a "network connection" alone, disregarding end-systems alias telephone sets. This is evidently false.

The BRI allegedly entitled asserting that a telephone call can be achieved by any connection enabling a data transfer. This is evidently false for connections controlled by a data retransmission based protocol (such as X.25 or TCP) as it untenably garbles the voice signal.

Thus, avoiding applying the BRI this strange way, one immediately recognizes: Anyone of the 4 prior art documents discloses only a network connection (i.e. is incapable of supporting a telephone set) and/or only an X.25 connection though the alleged packet-switching network (i.e. cannot achieve a telephone call).

(2) The in-C "**proactive signal**".

"Proactive" means that the pro-activity occurs before a potential problem can actually occur.

A commonly known automotive example illustrates the meaning of the claim term "signal", explained by the '902 specification. The claimed CII does not wait to release this signal until a loss of quality in the telephone call has occurred and only then releases the change-over signal – just like an "inflatable life vest" is only inflated after hitting the water. Instead, this CII proactively releases this signal as soon as the monitoring of the communications connection detects an indication of a potential loss of quality thereof, just like an "air bag" deploys if a sensor detects a bump potentially indicating an accident.

Again, none of 4 prior art documents discloses a pro-active change-over signal. There any signal either responds to a problem having occurred already (i.e. to a loss of quality actually encountered) or is released by the application only as it needs an increased bandwidth for an increased data volume to be transmitted – which does not occur in a telephone call, as it has a constant bandwidth requirement. Nevertheless the BRI is allegedly entitling asserting that the '902 signal is not pro-active, at all, but works just as one of the prior art signals – which evidently is false.

(3) The in-C "**1 call real-time change-over**".

The '902 change-over may be achieved by just dropping the packet-switched connection and affecting only a single call, i.e. not touching other ones. The BRI allegedly entitles asserting that both is immaterial and hence achieved by all prior art documents.

(4) The in-C "**any packet-/line-switched network**".

The claimed invention works on ANY packet-switching and line-switching network. But seemingly the BRI insinuated again, this is negligible and hence not at all worth considering.

Summarizing these 4 applications of the BRI guideline: If it would not insinuate such broadenings in determining the meanings of these 4 key claim terms were tolerable, they would have been recognized, as required by *Mayo* – as 4 inventive concepts of the claim 68 CII[3)-6)].

As none of them represents a natural phenomenon and all 4 are independent etc. [25], this CII's novelty and nonobviousness is indicated.

Finally, for showing the claim 68 CII is also nonpreemptive (= not an abstract idea only [5]), it would be necessary to define its other in-Cs, too (skipped here, but done in [6,7,8]) for showing it passes the NAIO test, which then is a trivial FFOL exercise (see Section III).

The '453 claim 35 CII and the '902 claims 91/104[10] CIIs are based on the same specification as the claim 68 CII. Thus, the above broadening by BRI of the meanings of its claim 68 terms yields the same adulterations of the SPL test of these 3 CIIs.

Note finally, that already a good deal of the IT and communications technology based inventions is vastly model based, as many of their in-Cs are completely intangible, i.e. are plainly intellectual/

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[10] The additional inventive concept of these two '902 claims is a multiplexer. It handles the issue that several simultaneous such Internet calls between the same sites use several PSTN connections between their switches, thus causing unnecessary cost, as both switches may be equipped with a multiplexer each, which would put such calls – if they concurrently change-over to the PSTN – onto a single PSTN connection between them For the posc no commonly known multiplexers are used, as they must have additional and then novel though evident features. They namely must accommodate the change-over of an Internet telephone call, from the Internet connection between the switches onto a PSTN connection between them, at least as to •) address resolution (Which PSTN address belongs to an IP address, if e.g. the IP call establishment failed?) as well as to •) monitoring information (Is a potentially encountered network delay caused by the Internet or the PSTN?). The need of this support by the multiplexers is communicated to them by a respective command to the multiplexer on the caller's site when changing-over a call to it, as the specification discloses.

fictional – i.e. a good deal of the phenomena they rely on are totally intangible[11].

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[11] The '902 patent also is a nice example of its claimed invention being model based – a common feature of virtually all emerging technology inventions – and how its model is used for precisely describing it.

In the '902 case, as always in telecommunications, the underlying model is the ISO/OSI Reference Model and internationally standardized (while most specifications of model based claimed inventions use their own or some group's agreed on and hence non-standardized models). As is typical with reference systems alias paradigms alias models, they prescribe only commonly known features of the basic structures and functioning of the objects they support modeling, i.e. never describe all their technical details. Here the subject matter object modeled is a "communications connection". Some commonly known features of a communications connection are that it is an end-system-to-end-system connection alias association on this models Layer 7, whereby any association exists as soon as its associated entities are known. An existing communications connection/association is routed over many entities, routed over different networks, and its working may be monitored by such entities – as used by the '902 specification, enabled by the model underlying it.

And similarly is the specification of e.g. a DNA based invention supported by a "DNA model". Here no standard exists yet, i.e. this DNA model would be assumed by the inventor, without thinking about this assumption, to be commonly known and to represent some DNA features precisely known by the posc. These features then would be used in the specification of the DNA based invention.

CONCLUSIONS

Neglecting claim construction is the main source of the confusion as to the patent-eligibility of emerging technology inventions, also the massive deficiencies of classical claim construction. Although these were fixed by the Highest Courts' *Phillips/ Mayo* decisions, uncertainties prevail – as shown in Section II by the USPTO's BRI guideline.

This is elaborated on in Sections III and IV by two topical computer-implemented inventions. In their cases claim construction has been completely ignored resp. applied by using the BRI, which caused total confusion – not only as to testing such a claimed invention under § 101 but also as to testing it under §§ 102/103. From these Sections also follows that these confusions would have been completely avoided by proceeding in their claim constructions as required by *Mayo*: This would namely have indicated in both cases that their claimed inventions are made up from inventive concepts, of which at least some (Section III) resp. all (Section IV) are patent-eligible and patentable. As to testing, whether a claimed invention satisfies SPL, the *Mayo* decision vastly comprises the *Phillips* decision (e.g. except § 112.6).

In total, there is a clear answer to the Supreme Court's question as to the patent-eligibility of a computer-implemented invention. This answer, following from the here preceding elaborations and those in the recent SSBG Amicus Briefs to the Supreme Court [18,19] and tells:

- This enquiry must be started by construing, for the computer-implemented invention, the § 112 claim construction as required by *Mayo* – explained in full detail by [18,19,25].

  I.e.: Skipping construing the claim construction for the computer-implemented invention or construing it only the classical or even the BRI way, makes its answer definitively questionable.
- This "post-*Mayo*" alias "refined" claim construction and the so determined elementary inventive concepts of the claimed invention show, whether at least one of them is not representing a natural phenomenon. By *Mayo* this is a necessary condition for the claimed invention's patent-eligibility.
- "Abstract idea" inventive concepts passing § 112 don't exist.
- Therefore the claimed invention is by *Mayo* patent-eligible iff it is "not an abstract idea only".
- The claimed invention meets this then sufficient condition – i.e. is nonpreemptive [5] – iff it passes the NAIO [19] test.
- For any FFOL-CII it is easy to decide, whether it passes the NAIO test and hence is patent-eligible. All hitherto encountered CIIs are of FFOL.

This is the general reply to the above question, focused on computer-implemented inventions.

For another model based claimed invention – than a FFOL-CII – it may be difficult to apply the NAIO test for showing its inventive concepts prove its non-preemptivity. If the Supreme Court should invite Amicus Briefs as to such more general patent-eligibility questions – or those of other Substantive IP Laws, relaxed as compared to SPL [35,36], the resp. IPL-eligibility questions occurring there, too –

they would be explained in more detail by another SSBG Amicus Brief. Though, a similar strong answer as for special case of CIIs must not be expected.

At least one of these cases should be decided by the Highest Courts – clearly in the light of the *Mayo* decision. This would provide the needed guidance how to execute *Mayo's* claim construction for a computer-implemented claimed invention, i.e. how to proceed on this higher level of US patent precedents.

In total: By the *KSR/Bilski/Mayo/Myriad* decisions, the US Supreme Court has achieved a quantum leap in interpreting the Substantive Patent Law of 35 USC. With the *Mayo* decision, US SPL precedents has now been risen to a level enabling courts to achieve predictable and consistent decision-making, also for claimed inventions based on emerging technologies. This interpretation of SPL provides a guidepost also for the rest of the world.

By its *Markman* decision the Supreme Court has established that – via the unique CAFC and its constitutional guidance by the unique Federal Supreme Court – the US market may, as the only one of the world's large markets, rapidly introduce and guarantee the application of this predictable and consistent decision-making as to emerging technology inventions. This continues resp. stimulates and at the same time protects the innovativity of the US economy as to these for the society so important technologies to a degree as currently not achievable in other world markets12).

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[12] Last week it turned out that the PRC is going to set up a similar unitary IP Court system as the US one.

Respectfully Submitted,

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AMICUS
CURIAE
BRIEF

No. 13-298

IN THE
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,
v.

CLS BANK INTERNATIONAL
AND CLS SERVICES LTD.,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

BRIEF OF SOFTWARE FREEDOM LAW CENTER, FREE SOFTWARE FOUNDATION, AND OPEN SOURCE INITIATIVE AS *AMICI CURIAE* IN SUPPORT OF RESPONDENTS

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QUESTION PRESENTED

Whether claims to computer-implemented inventions—including claims to systems and machines, processes, and items of manufacture—are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?

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INTEREST OF AMICI CURIAE

Software Freedom Law Center

Much of the world's most important and most commercially significant software is distributed under copyright licensing terms that give recipients freedom to copy, modify and redistribute the software ("free software").[1] One could not send or receive e-mail, surf the World Wide Web, perform a Google search or take advantage of many of the other benefits offered by the Internet without free software. Indeed, this brief was written entirely with free software word processors, namely GNU Emacs and LaTeX, each of which are not just competitive with or superior to non-free software programs, but which also provide their users with the freedom to improve the program to fit their needs and reflect their desires.

The Software Freedom Law Center ("SFLC") is a not-for-profit legal services organization that provides legal representation and other law-related services to protect and advance free software. SFLC provides pro bono legal services to non-profit free software developers and also helps the general public better understand the legal aspects of free software. SFLC has an interest in this matter because the decision of this Court will have a significant effect on the rights of the free software developers and users SFLC represents. More specifically, SFLC has an interest in ensuring that limits are maintained on the reach of patent law so that free software development is not unreasonably and unnecessarily impeded.

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[1] Pursuant to Sup. Ct. R. 37.6, amici note that no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No persons other than amici curiae and their counsel made a monetary contribution to its preparation or submission. Petitioners and Respondents have consented to the filing of this brief through blanket consent letters filed with the Clerk's Office.

Free Software Foundation

This brief is filed on behalf of the Free Software Foundation, a charitable corporation with its main offices in Boston, Massachusetts. The Foundation believes that people should be free to study, share and improve all the software they use and that this right is an essential freedom for users of computing. The Foundation has been working to achieve this goal since 1985 by directly developing and distributing, and by helping others to develop and distribute, software that is licensed on terms that permit all users to copy, modify and redistribute the works, so long as they give others the same freedoms to use, modify and redistribute in turn. The Foundation is the largest single contributor to the GNU operating system (used widely today in its GNU/Linux variant for computers from PCs to supercomputer clusters). The Foundation's GNU General Public License is the most widely used free software license, covering major components of the GNU operating system and hundreds of thousands of other computer programs used on hundreds of millions of computers around the world. The Foundation strongly rejects the use of patent law to control the making and distribution of software. It believes that the misapplication of patent law to computer software prevents the development, distribution and use of free/libre software, and therefore endangers users' control of their digital activities.

Open Source Initiative

The Open Source Initiative ("OSI") is a not-for-profit organization that supports and promotes the open source movement. Open source is a development method for software that harnesses the power of distributed peer review and development to build better software. The resulting software is globally available, and provides more user flexibility and reliability, at lower cost than traditional, centralized software development methods. Founded in 1998 by some of the people who coined the term "open source", OSI promotes open source development, advocates for the open source community, and maintains the Open Source Definition that helps determine whether a project is open source. OSI's membership is global, and includes individual developers, affiliated open source projects, and corporate sponsors who participate in and benefit from open source. OSI has an interest in this matter because the decision of this Court will have a significant effect on the rights and activities of the developers and users who make up the open source movement. In particular, OSI has an interest in limiting the reach of patent law so that open source software development is not unreasonably impeded.

SUMMARY OF ARGUMENT

As this Court has held consistently, any subject matter that risks pre-empting free use of laws of nature, algorithms, or abstract ideas is not eligible for patenting. This Court has repeatedly stated that, in determining the patentability of processes, the presence of a particular machine or apparatus or transformation of matter is a strong clue that the process claimed is patent-eligible under §101. *Cochrane* v. *Deener*, 94 U.S. 780, 788 (1877); *Gottschalk* v. *Benson*, 409 U.S. 63, 70–71 (1972); *Parker* v. *Flook*, 437 U.S. 584, 588 n. 9 (1978); *Diamond* v. *Diehr*, 450 U.S. 175, 184 (1981); *Bilski* v. *Kappos*, 130 S. Ct. 3218, 3227 (2010); *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1303 (2012).

The present case raises the question how to determine patent eligibility for computer-implemented inventions only, a narrower category of patent applications than those considered in *Bilski*. In this narrower category of cases, the Court should adopt the "machine or transformation" test as the bright line. In the more than sixty years since the adoption of the 1952 Patent Act amendments, the Court has never faced a patent application for a computer-implemented invention that failed the "machine or transformation" test and yet fell within the scope of §101. Speculation about such possible cases should not prevent the clarity that adoption of a bright-line test would bring.

The "built-in" accommodation between copyright law and the First Amendment, *see Eldred* v. *Ashcroft*, 537 U.S. 186, 219 (2003), is present, but in a different form, in patent law. In *Eldred*, the Court held that the idea/expression distinction and the fair use principle are constitutionally required to prevent collision between copyright and the First Amendment. The same required function is performed in patent law by the exemption of all subject matter that pre-empts free use of laws of nature, algorithms and abstract ideas. In cases involving computer software, the risk of creating statutory monopolies on ideas is particularly high, because computer programs, as the Court has held, are abstract ideas without physical embodiment. The

Court must construe the Patent Act to avoid constitutional infirmity, and it does so in this context by applying the "machine or transformation" test to such applications seeking statutory monopolies for computer-implemented inventions.

ARGUMENT

I. Processes Are Not Patentable If They Are Implemented Solely Through Computer Software, Without a Specialized Machine, or Transformation of Matter, As This Court Has Uniformly Held

As Justice Breyer noted in *Bilski*, 130 S. Ct., at 3258:

> [A]lthough the text of §101 is broad, it is not without limit. ... In particular, the Court has long held that '[p]henomena of nature, though just discovered, mental processes and abstract intellectual concepts are not patentable' under §101, since allowing individuals to patent these fundamental principles would 'wholly pre-empt' the public's access to the basic tools of scientific and technological work.

(internal citations omitted) (quoting *Benson*, 409 U.S., at 67, 72) (citing *Diehr*, 450 U.S., at 185; *Diamond* v. *Chakrabarty*, 447 U.S. 303, 309 (1980)).

In keeping with this principle, the Court has recognized in an unbroken series of cases extending over more than a century that patents should not be allowed to preempt the fundamental tools of discovery which should remain "free to all ... and reserved exclusively to none." *Funk Brothers Seed Company* v. *Kalo Inoculant Company*, 333 U.S. 127, 130 (1948). Patent eligibility at the constitutional limit cannot be made the handmaiden of a clever draftsman. The test articulated for patentability must take no account of the terms in which claims are posed. The Court has stated that "[t]ransformation and reduction of an article to a different state or thing is the clue to the patentability of a process claim that does not include particular machines." *Benson*, 409 U.S., at 71 (internal quotation marks omitted). Summarizing this history, *Flook* remarked that the Court had "only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a 'different state or thing.'" 437 U.S., 588 n. 9 (quoting *Cochrane* v. *Deener*, 94 U.S, at 787–88). In *Diamond* v. *Diehr*, 450 U.S., at 184, this Court once again applied the "machine or transformation" test regarding the patentability of processes under §101. Though the Court has repeatedly cautioned that the "machine or transformation" test is not the *sole* expression of the limits of §101, *Bilski*, 130 S. Ct., at 3227 *Benson*, 409 U.S., at 71, the *Flook* Court's generalization remains accurate: this Court has never approved the patentability of a computer-implemented process which involved neither special apparatus nor transformation of matter. This Court should now hold, in keeping with its unbroken precedents, that computer software, in particular, cannot be the sole component of a patentable process. To patent a process implemented in computer software, the invention claimed must additionally include either a special purpose apparatus, not merely a general purpose computer to execute the software, or a transformation of matter.

A. HISTORICALLY, ANY SUBJECT MATTER THAT PRE-EMPTS THE FREE USE OF LAWS OF NATURE, ABSTRACT IDEAS, OR ALGORITHMS IS UNPATENTABLE

Since before the Civil War, this Court has consistently made it clear that subject matter which would have the practical effect of monopolizing laws of nature, abstract ideas or mathematical algorithms is ineligible for patent protection. *O'Reilly* v. *Morse*, 56 U.S. (15 How.) 62, 113 (1854); *Gottschalk* v. *Benson*, 409 U.S. 63; *Parker* v. *Flook*, 437 U.S. 584; *Diamond* v. *Chakrabarty*, 447 U.S. 303; *Diamond* v. *Diehr*, 450 U.S. 175; *Bilski* v. *Kappos*, 130 S. Ct. 3218; *Mayo Collaborative Services* v. *Prometheus Laboratories, Inc.*, 132 S. Ct. 1289.

In *O'Reilly* v. *Morse*, the Court rejected Samuel Morse's claim to the use of "electromagnetism, however developed, for making or printing intelligible characters, signs or letters, at any distances." 56 U.S., at 112 (internal quotation marks omitted). The Court said:

> If this claim can be maintained, it matters not by what process or machinery the result is accomplished. For aught that we now know, some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current, without

> using any part of the process or combination set forth in the plaintiff's specification. His invention may be less complicated — less liable to get out of order — less expensive in construction, and in its operation. But yet, if it is covered by this patent, the inventor could not use it, nor the public have the benefit of it, without the permission of this patentee.

Id. at 113.

In *Benson*, this Court considered the claim to a method for converting numerical information from binary-coded decimal numbers into pure binary numbers, for use in programming conventional general-purpose digital computers. The Court concluded that "[t]he mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed, the patent would wholly pre-empt the mathematical formula involved and in practical effect would be a patent on the algorithm itself." 409 U.S., at 71–72. Accordingly the claims were held ineligible under §101.

In *Parker* v. *Flook*, the Court held that to be eligible for patent protection, "[t]he process itself, not merely the mathematical algorithm, must be new and useful." 437 U.S., at 591; *see also*, *Funk Brothers*, 333 U.S., at 130. The Court further stated in *Flook* that it is "incorrect[] [to] assume[] that if a process application implements a principle in some specific fashion, it automatically falls within the patentable subject matter of §101." 437 U.S., at 593. This Court explained that such an assumption is based on an impermissibly narrow interpretation of its precedents, including specifically *Benson*, and is "untenable" because "[i]t would make the determination of patentable subject matter depend simply on the draftsman's art, and would ill serve the principles underlying the prohibition against patents for 'ideas' or phenomena of nature." *Id.*

In alignment with *Benson* and *Flook*, this Court's decision in *Diamond* v. *Diehr* held that structures or processes must, when considered as a whole, perform functions intended to be covered by patent law in order to be eligible for patent protection. 450 U.S., at 192.

In rejecting the patentability of a "business method" implemented in computer software, the Court in *Bilski* stated that "[A]llowing [the claims] would preempt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea." 130 S. Ct., at 3231. The Court also held that such claims cannot be made patent eligible by "limiting an abstract idea to one field of use or adding token postsolution components," thereby affirming the rejection of the claims under §101. *Id.*

More recently, in *Mayo*, while rejecting the claimed processes as "routine, conventional activity previously engaged in by researchers in the field," the Court stated that its decisions

> warn us against interpreting patent statutes in ways that make patent eligibility 'depend simply on the draftsman's art' without reference to the 'principles underlying the prohibition against patents for [natural laws].' *Flook*, 437 U.S., at 593. They warn us against upholding patents that claim processes that too broadly

> preempt the use of natural law. *Morse*, 56 U.S., at 112–20. And they insist that a process that focuses upon the use of a natural law also contain other elements or a combination of elements.

132 S. Ct., at 1294.

Benson, *Flook*, *Diehr*, and the other decisions of this Court regarding patentable subject matter consistently establish that the inquiry into whether subject matter is eligible for patenting is one of substance, not form.

This substantive standard ensures that skilled patent draftsmanship is not capable of overcoming one of the core doctrines of patent law recognized by this Court for more than 150 years: that "[a] principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." *Le Roy* v. *Tatham*, 55 U.S. (14 How.) 156, 175 (1853).

B. COMPUTER PROGRAMS ARE ALGORITHMS FOR COMPUTERS TO EXECUTE WRITTEN IN HUMAN-READABLE TERMS. STANDING ALONE, WITHOUT SPECIALIZED MACHINERY OR THE TRANSFORMATION OF MATTER, THEY ARE NOT PATENTABLE, AS THIS COURT HAS REPEATEDLY HELD

This Court has repeatedly addressed the issue whether software is patentable subject matter, and has never found software standing on its own an appropriate subject of patent monopoly, no matter how the claims have been drafted.

In *Microsoft* v. *AT&T*, 550 U.S. 437 (2007), the Court stated that software program code is an idea without physical embodiment and is merely information—a detailed set of instructions. Such abstract ideas without physical embodiment cannot be the subject of a statutory patent monopoly because, "[a]n idea of itself is not patentable." *Rubber-Tip Pencil* v. *Howard*, 87 U.S. (20 Wall.) 498, 507 (1874).

A computer program, no matter what its function, is nothing more or less than a collection of abstract ideas comprising one or more algorithms. It is not conceptually different from a list of steps written down with pencil and paper for execution by a human being. In fact, computer software in source code form is *precisely* a list of steps written for the reading of human beings, who can learn from, and fix errors in, the computer program represented. Further, just as claiming fifty—or even a thousand—laws of nature is no more patentable than claiming a single law of nature, no form of software, regardless how many algorithms or formulas it comprises, is patentable. In no uncertain terms, this Court in *Benson*, 409 U.S., at 71–73, held that software, which contains and upon command executes algorithms that solve mathematical problems through the use of a computer, is not patentable under §101.

Thus, as the Court's precedents unambiguously show, software standing alone, without the presence of a special purpose machine or the act of transforming a particular article into a different state or thing, is merely information, a representation of an algorithm or algorithms, and not a "process" within the meaning of §101.

This Court's decision in *Diamond* v. *Diehr* is not to the contrary. It followed the teaching of *Benson*, applied in substance the "machine or transformation" test, and determined that the invention before the Court was not substantially the software, but rather the totality of an "industrial process for the molding of rubber products," which was undeniably included within the realm of patentable subject matter. 450 U.S., at 191–93. Had the applicant sought to claim the software used in that process by itself, however, the Court would surely have found it to be unpatentable subject matter just as it had in *Benson*. As the *Diehr* Court observed:

> [W]hen a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.

450 U.S., at 191 (internal citations omitted).

This result—which makes software describing a portion of the solution to a practical problem unpatentable on its own, outside the real-world context of the problem and its solution—is not only in accord with the rest of this Court's patent jurisprudence, it is also the best way to protect innovation in software, and the only way that fully comports with both Article I, §8 and the First Amendment.

Thus, this Court's precedent repeatedly sets out that software, which is nothing more than a set of instructions—an algorithm—to be performed by a computer in order to solve some technical or mathematical problem, is subject matter that is not patentable under §101.

C. THE "MACHINE OR TRANSFORMATION" TEST IS THE CORRECT AND COMPLETE TEST OF PATENT ELIGIBILITY FOR COMPUTER-IMPLEMENTED INVENTIONS

This Court held in *Bilski* v. *Kappos* that the "machine or transformation" approach is not the sole determinative measure of the patent eligibility of all processes. 130 S. Ct., at 3227. But the issue in the present case is narrower than that posed to the Court in *Bilski*. The question presented here concerns the patentability of computer software that duplicates the effects of a process previously undertaken without the benefit of computer assistance. No special apparatus or transformation of matter having been presented as part of the claims, the subject matter is unpatentable. In this narrower domain it is appropriate for the Court, in line with its prior decisions, to hold that the "machine or transformation" test is the exclusive test for patent eligibility of computer-implemented inventions.

The Court in *Bilski* said that "there are reasons to doubt" that the "machine or transformation" approach can be the exclusive test for the patentability of "inventions in the Information Age." 130 S. Ct., at 3227. But when the question is narrowed to whether software standing alone should be patentable, there is little reason indeed for doubt. The Court has never so far faced an instance in which the "machine or transformation" test failed to distinguish between patent eligible and ineligible subject matter of this kind. Far from being a source of uncertainty, as the *Bilski* Court suggested it might be, *Id.*, the "machine or transformation" test would provide substantial certainty now lacking, by reinforcing the teaching of the unbroken precedent of 150 years.

No doubt the pace of change in the area of information technology is rapid. As we show below, the real lesson of contemporary technological development, however, is that patenting has had no positive effect on innovation in software. Uncertainty about what can be patented, on the other hand, has given rise to enormously wasteful litigation. But whatever the pace of innovation, it is unlikely to disclose what has not yet appeared since the beginning of the Information Age: a case in which software standing alone, that fails the "machine or transformation" test, nonetheless is patentable subject matter. In the unlikely event that such a *rara avis* is observed in future, the Court can modify or add to the test. In the meantime, the advantages of certainty that would accrue from the adoption of a clear, bright-line test that cannot be defeated by mere cleverness of draftsmanship would far outweigh the speculative concerns expressed by the Court in *Bilski*.

II. Adhering to the Court's Previous Decisions on Patentability of Software Standing Alone Does Not Imperil the Pace of Software Innovation

The nature of software, like mathematics or basic scientific research, is that innovation is best produced by free sharing. History shows that innovation in software over the last generation has occurred first in communities of free sharing, where patenting has been systematically discouraged.

A. INNOVATION IN SOFTWARE, LIKE INNOVATION IN MATHEMATICS, IS ENCOURAGED BY SCIENTIFIC PROCESSES OF FREE SHARING AND OPEN PUBLICATION, NOT BY GRANTING STATE-ISSUED MONOPOLIES ON IDEAS

If mathematics were patentable, there would be less mathematical innovation. Only those who were rich enough to pay royalties, or who benefited from subsidization by government, or who were willing to sign over the value of their ideas to someone richer and more powerful than themselves, would be permitted access to the world of abstract mathematical ideas. Theorems build upon theorems, and so the contributions of those who could not pay rent—and all the further improvements based upon those contributions—would be lost.

The principle that innovation is made possible by the free exchange of ideas is not recent, and is not limited to software. Indeed, our constitutional system of free expression since Thomas Jefferson is based on the recognition that control of ideas by power has never produced more ideas than their free and unrestricted circulation. The history of western science since the 17th century is one long testament to this truth, and it is that very history which gave rise to the patent system, whose exclusion of "abstract ideas," "laws of nature," and "algorithms" is as much a recognition of the principle as is the basic constitutional policy of offering temporary legal benefits in return for prompt and complete disclosure of technological discoveries to the public.

B. THE HISTORY OF THE FREE SOFTWARE MOVEMENT AND THE WORLDWIDE ADOPTION OF FREE AND OPEN SOURCE SOFTWARE BY INDUSTRY SHOWS THAT PATENTING SOFTWARE HAS NOT CONTRIBUTED TO THE IMPORTANT SOFTWARE INNOVATIONS OF THE LAST GENERATION

For more than a quarter century, beginning with a few stalwart thinkers and exponentially increasing in size and influence, a movement to build computer software by sharing—treating software programming languages like mathematical notation, for the expression of abstract ideas to be studied, improved, and shared again—has revolutionized the production of software around the world. The "free software movement," and the developers of "open source software" (collectively described hereinafter as "FLOSS developers") believe, like this Court, that computer software expresses abstract ideas. FLOSS developers therefore conclude that the ideas themselves will grow best if left most free to be learned and improved by all. Their conviction has been shared by hundreds of thousands—soon millions—of programmers around the world, who have devoted their skills to making new and innovative software through the social process that for centuries has been the heart of Western science: "share and share alike."

FLOSS has become the single most influential body of software around the world. In the more than twenty years of its existence, FLOSS has taken the world by storm and has driven the majority of the world's technological advancement in computer programming. FLOSS lives under the hood of it all—from desktops and servers, to laptops, netbooks, smartphones, and "the cloud." Linux, distributed under the GNU General Public License of the Free Software Foundation, is the operating system kernel in devices such as mobile phones, networking equipment, medical devices, and other consumer electronics. Android, which relies on Linux and includes the Java programming language and other software under the Apache Software Foundation's ALv2 license, currently has far and away the largest market share in smartphone operating system software. There is no major or minor computer hardware architecture, no class of consumer electronics, no form of network hardware connecting humanity's telephone calls, video streams, or anything else transpiring in the network of networks we call "the Internet" that doesn't make use of FLOSS. The most important innovations in human society during this generation, the World Wide Web and Wikipedia, were based on and are now dominated by free software and the idea of free knowledge sharing it represents.

Given the widespread use and availability of enterprise applications running on GNU/Linux in "the cloud," FLOSS presently provides the infrastructure at the frontier of computing in society. Big Data analytics rely heavily on FLOSS, such as the Hadoop project of the Apache Software Foundation.

The major technologies of the Web, from its beginning, have been embodied in software without patent restrictions. In the early 1990s, CERN, the European Organization for Nuclear Research, committed the Web's fundamental technologies, including initial web-serving and web-browsing programs, to the public domain. The flexibility and sophistication of the Web we use today depends on freely available scripting languages such as Perl and PHP, invented by FLOSS developers who deliberately did not seek patent monopolies for them. From 2000, the World Wide Web Consortium (W3C), which advances and standardizes the technology of the Web, has required its recommended technologies in its standards to be available royalty free with respect to all patent claims of the companies and parties participating in standards-making.

This explosion of technical innovation has occurred for two primary reasons. First, the principal rule of free software, the sharing of computer program source code, has allowed young people around the world to learn and to improve their skills by studying and enhancing real software doing real jobs in their own and others' daily lives. Statutory monopolies on ideas expressed in computer programs would have prevented this process from occurring. Second, by creating a "protected commons" for the free exchange of ideas embodied in program source code without rent-seeking by parties holding state-granted monopolies, FLOSS has facilitated cooperative interactions among competing firms. Google, Facebook, Twitter and other information services used by billions of individuals worldwide could not exist without FLOSS and the collaboration it has spawned.

The FLOSS developers and projects that comprise this world-wide movement generally do not own any patents, not only because they have no resources to file for state-granted monopolies, but also because the monopolization of ideas contradicts their fundamental values.

This Court has recognized the growth and innovation in the software industry in the absence of patent protection. In *Benson*, the Court noted that "'the creation of programs has undergone substantial and satisfactory growth in the absence of patent protection and that copyright protection for programs is presently available.'" 409 U.S., at 72 (quoting "To Promote the Progress of ... Useful Arts," Report of the President's Commission on the Patent System (1966)). In *Diehr*, the Court subsequently observed that "[n]otwithstanding fervent argument that patent protection is essential for the growth of the software industry, commentators have noted that 'this industry is growing by leaps and bounds without it.'" 450 U.S., at 217 (internal citations omitted).

Mere speculative doubts about the "machine or transformation" test in the "Information Age," *Bilski*, 130 S. Ct., at 3227, must give way to the reality of contemporary information technology. Sharing makes software innovation. Patenting of software standing alone constitutes the monopolization of ideas, which not only violates our constitutional principles but also interferes practically with software innovation. If this Court holds firmly to its prior course, technological innovation in software will continue to flourish. Otherwise we can expect more patent war, less product innovation, and less freedom of thought and invention in software.

III. The First Amendment Prohibits Construing the Patent Act to Permit the Patenting of Abstract Ideas

This Court held in *Eldred*, 537 U.S., at 219, that the First Amendment precludes the extension of statutory monopolies to abstract ideas. As the Court then observed, the near-simultaneous adoption of the Patent and Copyright Clause and the First Amendment indicates that these provisions are fundamentally compatible. *Id.* This compatibility, however, depends on a construction of the patent and copyright acts that preserves First Amendment principles, including the freedom to communicate any "idea, theory, and fact." *Id.*

Eldred identified two mechanisms in copyright law that are necessary to accommodate this principle. First, the idea/expression dichotomy limits copyright's monopoly to an author's expression, leaving ideas "instantly available for public exploitation." *Id.* Second, the fair use doctrine allows the public to use even copyrighted expression for some purposes, "such as criticism, comment, news reporting, teaching. . . , scholarship, or research." *Id.* at 220.

Patent statutes, which depend on the same constitutional grant of authority as copyright statutes, are similarly limited by the First Amendment. *See id.* at 201 ("Because the Clause empowering Congress to confer copyrights also authorizes patents, congressional practice with respect to patents informs our inquiry"). The presence of an unwavering exemption for abstract ideas reconciles patent law with the First Amendment in a fashion similar to the idea/expression dichotomy's crucial role in reconciling copyright and freedom of speech. The presence of a limiting principle is even more necessary with respect to patent law than with respect to copyright, because, as the Court observed in *Eldred*, "the grant of a patent . . . prevent[s] full use by others of the inventor's knowledge." *Id.* at 217 (internal citation omitted). Patents can and do limit the application of knowledge to produce a new machine or to transform an article into a different state or thing, but they cannot constitutionally limit the communication of knowledge or ideas. *Eldred* teaches that, without this limitation, determining the scope of patent eligibility in each individual case would raise First Amendment questions of great difficulty.

Patent law also recognizes no analogue to fair use, previously described by this Court as the second bulkwark of constitutional harmony between copyright and free expression. *Id.* at 219–20. The absence of any provision for fair use substantially increases the constitutional difficulty when patents are sought and granted for expressions of abstract ideas.

Without the "machine or transformation" test, dissemination of software standing alone, in source code form, could result in patent infringement. This would fatally disturb the "definitional balance" between the First Amendment and the Patent Act. *Id.* at 219 (quoting *Harper & Row, Publishers* v. *Nation Enterprises*, 471 U.S. 539, 556 (1985)). In its unprocessed source code form, software is merely the expression of abstract ideas in human language—a description of a sequence of steps that will produce a particular result (i.e. an "algorithm"). The source code of a program which performs the steps described in a software patent is distinguishable from the literal patent only in that it expresses the same steps in a different language. Therefore, since anyone may copy or publish the actual patent without infringing, it must also be permissible to communicate its claims in source code form.

The sharing of source code is also essential to "scholarship and comment," two categories of speech recognized in *Eldred*, 537 U.S., at 220, and *Harper &Row*, 471 U.S, at 560, as particular First Amendment concerns. Computer science textbooks, for example, rely heavily on source code and pseudo-code to communicate concepts and describe useful algorithms. *See, e.g.*, Brian W. Kernighan and Dennis M. Ritchie, The C

Programming Language (Prentice Hall 1978). Likewise, computer science students are often required to express their answers to test questions in a real or hypothetical programming language. And without the use of source code, it is difficult for developers to comment on whether an idea can be implemented, to comment on an algorithm's performance, or to suggest improvements.

The "machine or transformation" test serves the purpose of securing accommodation with the First Amendment by ensuring that patent claims on computer-implemented inventions cannot be comprised solely of ideas communicated in computer program code. By requiring a physical special-purpose apparatus or a material transformation, the test implements a construction of §101 that automatically avoids conflict with the First Amendment. If the "machine or transformation" test is *not* the exclusive delimitation of §101 as applied to computer-implemented inventions, what alternative proposal do petitioners and their *amici* advance to avoid First Amendment problems?

CONCLUSION

The "machine or transformation" test evolved over 150 years of this Court's jurisprudence should be affirmed as the necessary criterion for the patenting of inventions implemented in software.

For the foregoing reasons, the decision below should be affirmed.

Respectfully submitted,

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AMICUS
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In the
Supreme Court of the United States

ALICE CORPORATION PTY. LTD.,
Petitioner,

v.

CLS BANK INTERNATIONAL AND CLS SERVICES LTD.,
Respondents.

**On Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit**

BRIEF OF *AMICI CURIAE* TRADING TECHNOLOGIES INTERNATIONAL, INC., CANTOR FITZGERALD, L.P., CUMMINS INC., SCIENTIFIC GAMES CORPORATION, ALIGN TECHNOLOGY, INC., *ET AL.*, IN SUPPORT OF PETITIONER

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INTEREST OF THE *AMICI CURIAE*[1]

Amici curiae include a wide range of innovative companies from different industries, ranging from large publicly-traded companies to start-ups, that are directly impacted by the uncertainty created by the Federal Circuit's decision in *CLS Bank International v. Alice Corporation*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc), regarding the patent eligibility under 35 U.S.C. § 101 of claims directed to computer-implemented inventions, such as computer software and hardware. Although some *amici* companies are competitors, and some are even adversaries in patent litigation, all *amici* have a strong interest in ensuring that computer-implemented inventions are not subjected to restrictive patent eligibility rules, such as those suggested in some of the opinions below, which could incorrectly render many such inventions ineligible for patent protection under the judicial exception for "abstract ideas." *Amici* also include an inventor and distinguished professors who study the economic importance of patents.

Collectively, the 41 *amici* companies have made substantial investments in innovative computer-implemented inventions with applications in fields as diverse as telecommunications, medicine, financial services, consumer electronics, and gaming. For many such inventions, the innovation lies in how a computer is programmed (the software), and *amici* rely on patents to protect those innovations. These patents are not directed to "scientific truths" or mathematical expressions of scientific truths. If the law governing the "abstract ideas" exception is broadly conceived, the eligibility of vast numbers of patents covering computer-implemented inventions – inventions that are novel and non-obvious and not directed to "scientific truths" – would be called into question. This would have a devastating impact on *amici* and many other companies, costing jobs and damaging the economy.

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[1] Pursuant to Supreme Court Rule 37.6, *amici* note that no counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amici*, their members, or their counsel have made a monetary contribution to fund the preparation or submission of this brief. Pursuant to Supreme Court Rule 37.3(a), *amici* note that Petitioner and Respondents have consented to the filing of this brief through blanket consent letters filed with the Clerk's Office.

The 46 *amici* include: Trading Technologies International, Inc.; Cantor Fitzgerald, L.P.; Cummins Inc.; Scientific Games Corporation; Align Technology, Inc.; Alcatel-Lucent; CoreLogic; Aristocrat Technologies Australia Pty. Ltd.; Bancorp Services, LLC; NAGRA USA, Inc.; BGC Partners, Inc.; Fallbrook Technologies Inc.; Architecture Technology Corporation; Sonitus Medical Inc.; Miramar Labs, Inc.; Great Lakes NeuroTechnologies Inc.; NeuroWave Systems Inc.; Flocel Inc.; Cleveland Medical Devices Inc.; Orbital Research Inc.; Spectral MD; Ameranth Inc.; RPost Communications; Enounce, Inc.; ManyWorlds, Inc.; FPX; Charles River Analytics Inc.; Casino Gaming, LLC; Horizon Digital Finance LLC; DDB Technologies LLC; Chief Experience Officer, Inc.; MONKEYmedia, Inc.; ParkerVision, Inc.; Subtle by Design Co.; iQ4 LLC; Crowd Cart; House-Tab, LLC; Neo Prime Solutions, Inc.; TIP Solutions, Inc.; Bi-Level Technologies; RedTxt.com.au Pty. Ltd.;

U.S. Startups and Inventors for Jobs; Martin Goetz; Professor Richard A. Epstein; Professor Daniel F. Spulber; and Professor Jay P. Kesan. For a further description of *amici*, *see* Appendix.

INTRODUCTION AND SUMMARY OF ARGUMENT

In keeping with the Constitution's expansive grant to Congress of power to secure for "Inventors" exclusive patent rights to "promote the Progress of Science and useful Arts," U.S. CONST. art. I, § 8, cl. 8, Congress has since 1790 broadly defined the subject matter of inventions eligible for patent protection. For nearly as long, this Court has applied exceptions, of its own making, to Congress's designation of these "broad patent-eligibility principles." *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010). This case focuses on one of those judicial exceptions – the "abstract ideas" exception.

The Court granted *certiorari* to decide "[w]hether claims to computer-implemented inventions – including claims to systems and machines, processes, and items of manufacture – are directed to patent-eligible subject matter within the meaning of 35 U.S.C. § 101 as interpreted by this Court?" Importantly, the patent claims in this case do not recite "a scientific truth, or the mathematical expression of it,"[2] *Mackay Radio & Tel. Co. v. Radio Co. of Am.*,

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[2] The exception directed to laws of nature, physical phenomena and mathematical formulas (as set forth in this Court's precedents) addresses such types of claims. For simplicity, the term "scientific truth" is used herein to encompass scientific truths and mathematical expressions of such. Scientific truths

(Continued on following page)

306 U.S. 86, 94 (1939), and no court below entertained any evidence relating to whether the claims are novel and non-obvious under Sections 102 and 103 of the Patent Act. Thus, the question here is whether computer-implemented inventions that are not directed to a scientific truth should be deemed ineligible ***even if*** such inventions are novel, non-obvious, and otherwise patentable.[3]

In light of Section 101's expansive language unambiguously making "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof" eligible for patent protection, the answer to this latter question must be "no." There is no doubt that a computer-implemented invention qualifies as a "machine" (*e.g.*,

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are laws of nature, natural phenomena and pure mathematical laws or axioms. A scientific truth can be expressed in words or mathematically. For example, Einstein's theory of relativity is expressed mathematically as $E=mc^2$. Of course, as this Court's decisions make clear, not every invention involving mathematical calculations implicates this exception. Indeed, most do not, because they are applying mathematics, not reciting a pure mathematical law or axiom. For example, the automobile-related inventions discussed below apply mathematics (making distance and other calculations based on input from sensors).

[3] Petitioner reads *Bilski* to have rejected a patent that, like the patents rejected in previous decisions applying the "abstract ideas" exception, recited a "fundamental or mathematical truth." Pet. Br. 25-26. But because it is equally plausible, in *amici's* view, to read *Bilski* as applying the "abstract ideas" exception to claims that do *not* recite scientific truths, we devote our presentation to a demonstration of why computer-implemented inventions do not fall within the exception even as so conceived.

a computer programmed to carry out an invention), a "process" (*e.g.*, the series of steps performed by the programmed computer to carry out an invention), and an "article of manufacture" (*e.g.*, the programmable media on which software comprising the computer instructions is stored). Moreover, given that a general purpose computer is a "machine" within the meaning of the statute, it also follows that software providing new and useful functionality to a computer is an "improvement" of such a "machine."

The approaches to the "abstract ideas" exception suggested by some of the opinions below and by Respondents and their supporters are not grounded in law and will adversely impact tens of thousands of legitimate patents protecting inventions that solve pressing real-world problems in almost every industry. At the most basic level, the various tests proposed below that result in finding any of Petitioner's claims ineligible under Section 101 are based on a fundamentally flawed understanding of computer-implemented inventions today. These approaches are based on the false notions that a computer is merely a calculator and that programming merely instructs the computer to perform basic mathematical calculations. While this may have been true of many of the applications programmed on the earliest computers over 40 years ago (such as the program at issue in *Gottschalk v. Benson*, 409 U.S. 63 (1972)), it is simply not the case today.

The capabilities of computers have dramatically grown and evolved – computers are highly configurable machines capable of being turned into new and different machines through how they are programmed. Today, software forms the heart and soul of many innovative advances in all aspects of society, including automobiles, aircraft, mobile phones, audio/visual equipment, medical devices, gaming devices, engine and power generation systems, data mining and analysis tools, administration and management tools, and appliances. Viewing computers as merely calculators is completely disconnected from the reality of where innovation is occurring today and where most innovation will occur in the future.

Broadly construing and applying the abstract ideas exception would jeopardize countless patents and patent-fostered innovations that are providing real, tangible benefits to all levels of society, and that are helping to fuel the domestic and global economies. Indeed, it is impossible to overstate the economic importance of software and other computer-implemented inventions. Virtually all industries now use computer-implemented inventions in some way. As Judge Moore noted in her partial dissent below, between 1998 and 2011, the PTO issued more than 300,000 patents *in just one of* the host of patent classifications that include computer-implemented inventions. *CLS Bank*, 717 F.3d at 1313 n.1. Indeed, the U.S. Government Accountability Office recently reported that approximately 50% of all granted patents are software-related. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-13-465, INTELLECTUAL PROPERTY: ASSESSING FACTORS THAT AFFECT PATENT INFRINGEMENT LITIGATION COULD HELP IMPROVE PATENT QUALITY 12-13 (2013). This body of patents comprises an important literature that is available to researchers and developers in every field, who are free to use the information disclosed in these patents (much of which would otherwise be cloaked in trade secrecy) to develop improvements and, upon expiration of the patents, to practice the inventions.

Notably, and notwithstanding the alarmist complaints of some interested parties that are most dependent upon computer-implemented technologies,[4] high-tech industries are neither stagnating nor suffering from a dearth of innovation. To the contrary, these industries are highly competitive, vibrant fonts of innovation and economic vitality. The availability of patent protection for computer-implemented inventions has been a spur, not a bane, to their growth and development. Computer-implemented inventions thus reflect the patent system's "carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design in return for the exclusive right to practice the invention for a period of years." *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 150-51 (1989).

All of these benefits are put at risk by an expansive reading of the "abstract ideas" exception. Indeed, several members of the en banc Federal Circuit expressed concern that engrafting a broad "abstract ideas" exception onto the plain text of Section 101 would suffocate valuable innovation and investment in the field of software and computer technology. *See CLS Bank*, 717 F.3d at 1309 (Rader, C.J., *et al.*, concurring in part and dissenting in part); *id.* at 1332 (Linn & O'Malley, JJ., dissenting); *id.* at 1313 (Moore, J., dissenting in part).

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[4] Such complaints are hardly new. In the 1850s, for example, sewing machine manufacturers were up in arms over the proliferation of sewing machine patents, and yet judicial intervention was unnecessary to ensure innovation because private-ordering solutions eventually emerged. Adam Mossoff, *The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s*, 53 ARIZ. L. REV. 165, 170 (2011). Similarly, such unfounded complaints were made in the 1980s about the number of semiconductor patents.

The warring opinions below vividly reflect the widespread confusion regarding how to apply the "abstract ideas" exception.[5] It is therefore imperative that the Court now provide concrete, practical guidance regarding the exception's scope and analytical contours. *Amici* respectfully urge the Court to make two points clear, both of which are compelled by the language and history of the Patent Act, this Court's precedents, the Constitutional separation of powers, and the purposes underlying the Constitution's grant of power to Congress to promote technological innovation through the patent system.

First, insofar as it applies to claims that do not recite scientific truths (*see* note 3, *supra*), the "abstract ideas" exception to Section 101's broad designation of patent-eligible subject matter must be narrowly construed and applied. As stated in *Benson*, the proper focus of the exception is on "abstract *intellectual* concepts" – that is, purely mental impressions or processes. 409 U.S. at 67 (emphasis added). As this Court has repeatedly acknowledged, Congress chose, for sound policy reasons and in the considered exercise of its Article I powers, to give expansive, permissive scope to the subject matter of inventions and discoveries eligible for patent protection. It *should* be the rare claimed invention that does not satisfy the generous eligibility criteria established by Congress, and for the courts to broadly apply judge-made exceptions to those statutory criteria would threaten both to usurp congressional authority and to stifle technological innovation.

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[5] *See also* Mark A. Lemley, *et al.*, *Life After* Bilski, 63 STAN. L. REV. 1315, 1316 (2011) ("*Lemley*") (Following *Bilski*, "the problem is that no one understands what makes an idea 'abstract,' and hence ineligible for patent protection." (footnote omitted)).

Second, the exception to Section 101 established in this Court's precedents dealing with "laws of nature, physical phenomena and mathematical formulas" (*i.e.*, claims directed to scientific truths), is not implicated in this case. The exception to Section 101 that is implicated here – the exception for "abstract ideas" – merely asks whether a claim fails to recite tangible elements, such as computing elements. Patent claims that disclose an invention requiring implementation through computer devices or programmable media do not and cannot constitute an "abstract idea" for purposes of the Section 101 eligibility inquiry. This is not to say that all such claims are patentable; some will fail to satisfy novelty, nonobviousness, and other conditions governing patentability. But a claim that is not directed in any way to a "scientific truth" and that recites tangible elements (such as computing elements) cannot be deemed ineligible under Section 101. Not only do such claims fall well within the realm of eligible subject matter defined by the language and history of the Patent Act, but their eligibility under Section 101 is also entirely consistent with this Court's precedents.

ARGUMENT

I. TESTS THAT CALL INTO QUESTION THE PATENT ELIGIBILITY OF COMPUTER-IMPLEMENTED INVENTIONS NOT DIRECTED TO SCIENTIFIC TRUTHS ARE FLAWED AND SHOULD BE REJECTED.

As discussed below, this Court's precedents on the question of subject matter eligibility demonstrate a consistent effort by this Court to distinguish between ineligible patent claims directed toward fundamental "principles" and eligible patent claims directed toward the beneficial and practical "application" of such principles. Although drawing the line between a principle and its practical application is usually straightforward, this Court's precedents suggest that for some inventions that implicate scientific truths, drawing that line may raise complexities. Because such a scientific truth "reveals a relationship that has always existed," *Parker v. Flook*, 437 U.S. 584, 593 n.15 (1978), it cannot be "invented" within the meaning of Section 101. This Court, therefore, has at times suggested that a claim that adds an additional tangible step or element to a scientific truth must itself demonstrate some "inventive" quality for the resulting claim to become patent eligible. *See, e.g.*, *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012); *Flook*, 437 U.S. at 594.

No such problem exists for inventions that are *not* directed to such scientific truths. The abstract ideas at the heart of such inventions did not, like the law of gravity, always exist in nature; rather, they were brought into being by human ingenuity. These ideas were therefore undeniably "invent[ed]" within the meaning of Section 101. So long as patents directed to such ideas claim statutory subject matter (processes, machines, etc.), they fall comfortably within the realm of patent-eligible inventions. The only question under the judicial exception for "abstract ideas" is whether the patent claim is so broad that it is unmoored to anything tangible. Simply put, if a claim not directed to a scientific truth requires implementation through tangible steps or elements such as computer hardware or software, this Court's precedents support, and indeed compel, the conclusion that it satisfies Section 101 and does not fail under the "abstract ideas" exception.[6]

Under this test, the "abstract ideas" exception presents no obstacle to the patent eligibility of the computer-implemented inventions at issue in this case. As the parties stipulated, and unlike the claims in *Bilski*, the claims here require computer implementation. Again, passing this threshold test of eligibility says nothing about whether the claims satisfy other statutory provisions governing the patentability of inventions, an issue on which *amici* take no position.

In contrast to the straightforward test we propose, any test that would result in some or all of the claims here being invalidated as ineligible "abstract ideas" would likewise call into question vast numbers of patents claiming innovative computer-implemented inventions. The approach taken in the plurality opinion below – which first seeks to identify and extract "whatever fundamental concept appears wrapped up in the claim" (*i.e.*, the supposedly "abstract idea" at the heart of the claim[7]), and then examines whether the "balance of the claim . . . contains additional substantive limitations" that supply an inventive quality to the claim, *CLS Bank*, 717 F.3d at 1282 – would threaten countless legitimate patents. As just one example, consider innovations in certain newer automobiles such as automatic parallel parking, lane departure warning systems, and collision avoidance technology. The plurality's proposed test would threaten the patent eligibility of such inventions, for their inventive aspect lies in the processes that are programmed into the automobile's on-board computer rather than in any of the tangible items that may be recited in a claim: for example, none of the claimed sensors, computing elements, and automobile parts are new. And as Judge Moore explained, the plurality's proposed test "imbues the § 101 inquiry with a time-dependency that is more appropriately the province of §§ 102 and 103. . . . But § 101 is not a moving target – claims should not become abstract simply through the passage of time." *CLS Bank*, 717 F.3d at 1315 (Moore, J., dissenting in part).

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[6] This straightforward test is consistent with the precedents of this Court, including but not limited to the principle that "mental processes" may not be patented. *Benson*, 409 U.S. at 67. *See also In re Comiskey*, 554 F.3d 967, 979 (Fed. Cir. 2009) ("[M]ental processes – or processes of human thinking – standing alone are not patentable even if they have practical application.").

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[7] Notably, none of the opinions below satisfactorily explains what it means for a concept to be impermissibly "abstract." The plurality stated that the concept at issue here – reducing settlement risk through an escrow-like transaction – is abstract "because it is a 'disembodied' concept, a basic building block of human ingenuity, untethered from any real-world application." *CLS Bank*, 717 F.3d at 1286 (citation omitted). This formulation offers no practical guidance that would provide any hope of predictability in determining whether a claim is directed to an abstract idea. Moreover, as Petitioner ably demonstrates, the plurality's vague definition of an "abstract" concept itself arguably does not describe Petitioner's claims at all. Pet. Br. 47-48.

The automobile-related inventions discussed above comprise just one example of the types of innovative and beneficial inventions implicated by any test that threatens patents whose inventive aspect lies in the steps being programmed as opposed to the already existing tangible devices or systems that are controlled or directed by such programming. Countless other valuable inventions, for which patenting has already been permitted, fall into this category, including life-saving medical devices, appliances, tools used in the financial services industry (*e.g.*, fraud detection technology), robotics, and games.

Many of the proposed "tests" that would render ineligible claims covering computer-implemented inventions (that are not directed to scientific truths) are also based on the false notion that there is something unique about computer-implemented inventions that raises questions about their patent eligibility. But there is no meaningful difference between computer-implemented inventions and other types of inventions. Contrary to the plurality's suggestion that "[a]t its most basic, a computer is just a calculator capable of performing mental steps faster than a human could," *id.* at 1286, a computer is a highly configurable machine that is capable of being turned into new and different machines based on how it is programmed. And the act of invention on a computer is fundamentally the same as the act of invention throughout history: a person today conceiving an idea that solves a problem in a unique and beneficial way and then programming a computer to implement that idea is no different from Thomas Edison conceiving an idea and implementing it in a lab. Both involve the conception and reduction to practice of an idea. That the technology of computers has enabled inventors to reduce ideas to practice faster and more efficiently than they could when working with other materials is irrelevant to the patent eligibility question.

Furthermore, the unsupported complaints by some that patents on computer-implemented inventions are too broad and imprecise are misplaced.[8] This objection is not unique to computer-implemented inventions – a patent on any type of invention can have broad or ambiguous claims. The patentability provisions of the Patent Act provide powerful tools to weed out such "bad" patents or inventions, and a special threshold rule that, intentionally or not, renders ineligible *per se* computer-implemented inventions (that are not directed to scientific truths) would contradict the statute and do far more harm than good.

Finally, Respondents and their *amici* will likely point to alleged statistical "evidence" regarding the amount of litigation involving computer-implemented inventions by so-called "non-practicing entities" ("NPEs") to support a case for discriminating against software patents. Section 101, however, was purposefully designed by Congress to be a dynamic provision that would promote and protect innovation in *all* fields, especially innovations in new, emerging, and previously unforeseen fields, and it is a particularly inappropriate vehicle for a rule that would discriminate against particular fields or classes of inventions. Any debate about whether the costs to society of computer-implemented inventions are too high belongs in Congress rather than in the courts.[9] Such questions "involve[ ] the balancing of competing values and interests, which in our democratic system is the business of elected representatives." *Diamond v. Chakrabarty*, 447 U.S. 303, 317 (1980).

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[8] This Court has flatly held that arguments seeking a rule denying eligibility to so-called "business method" claims have no support in the statute. *Bilski*, 130 S. Ct. at 3228. Furthermore, any proposed definition of "business method," required by such a rule, is necessarily vague and would inevitably make Section 101 an issue for vast numbers of patents and lead to uncertainty and conflicting results.

II. THE JUDICIAL EXCEPTION TO PATENT ELIGIBILITY FOR "ABSTRACT IDEAS" MUST BE CONSTRUED AND APPLIED NARROWLY.

Section 101, by its plain language, reflects a consistent congressional policy to define patent-eligible subject matter in an expansive and permissive manner, not only to encourage innovations in traditional and established industries, but also to foster the creation and development of technologies and fields of endeavor that can scarcely be imagined today. Given that the legislative branch has chosen, in the faithful exercise of its constitutionally assigned authority, to broadly define eligible subject matter, it is critical that any effort by the judicial branch to place limits on such subject matter be carefully circumscribed, to ensure that Congress's legislative power is not encroached upon and its legislative purposes are not frustrated. The historically recognized judicial exceptions to patent eligibility, therefore, must be narrowly construed and should be applied only in the clearest of cases. This is especially true with respect to the much more malleable exception for "abstract ideas."

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[9] Moreover, some studies reach different conclusions regarding whether NPEs assert lower-quality patents than other patent holders and whether patent rules should be structured to target these entities. *See, e.g.*, Jonathan H. Ashtor, *et al.*, *Patents at Issue: The Data Behind the Patent Troll Debate* 18-19 (Nw. Univ. Sch. of Law, Working Paper, Oct. 2013), *available at* www.law.northwestern.edu/faculty/programs/searlecenter/innovationeconomics/documents/Mazzeo_Zyontz_Ashtor_patents_at_issue.pdf.

A. The Text and History of Section 101, and a Proper Respect for Congress's Constitutionally Assigned Authority To Define Patent-Eligible Subject Matter, Require that Judicial Exceptions to Patent Eligibility Be Narrowly Construed.

Section 101 of the Patent Act describes four broad categories of inventions or discoveries that are eligible for patent protection:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101.

This Court has repeatedly observed that Section 101 represents a "broad"[10] and "expansive"[11] definition of patent-eligible subject matter. Thus, in *Bilski*, the Court reaffirmed that "[i]n choosing such expansive terms . . . modified by the comprehensive 'any,' ***Congress plainly contemplated that the patent laws would be given wide scope.***" ***Bilski***, 130 S. Ct. at 3225 (emphasis added) (citations omitted).

The relevant statutory history confirms that Congress has consistently legislated to the boundaries of its constitutional authority to "promote the Progress of Science and useful Arts." The precursor to the current version of Section 101 was enacted as part of the Patent Act of 1793, which broadly defined patent-eligible subject matter to include "any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement [thereof]." *See Chakrabarty*, 447 U.S. at 308. That statute "embodied [Thomas] Jefferson's philosophy that ingenuity should receive a liberal encouragement." *Id.* (citation and quotation marks omitted).

Congress modified the statute in 1952, replacing the word "art" with "process." *See Diamond v. Diehr*, 450 U.S. 175, 182 (1981). Congress made clear that its amendment was not intended to narrow the scope of eligible subject matter, for it broadly defined

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[10] *See Bilski*, 130 S. Ct. at 3225; *J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 131 (2001); *Chakrabarty*, 447 U.S. at 308.

[11] *Chakrabarty*, 447 U.S. at 308.

"process" to include a "process, art or method, and . . . a new use of a known process, machine, manufacture, composition of matter, or material." 35 U.S.C. § 100(b).

As this Court has emphasized, "[t]he subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting 'the Progress of Science and the useful Arts,' with all that means for the social and economic benefits envisioned by Jefferson." *Chakrabarty*, 447 U.S. at 315. Section 101 is thus "a dynamic provision designed to encompass new and unforeseen inventions." *J.E.M.*, 534 U.S. at 135; *see also Chakrabarty*, 447 U.S. at 316 ("Congress employed broad general language in drafting § 101 precisely because such inventions are often unforeseeable.").

Notwithstanding Congress's deliberately broad definition of patent-eligible subject matter, this Court has itself excluded certain types of subject matter from patent protection. While the Court's precise description of these judicially created exceptions has varied over time, recent decisions have referred to them as the exceptions for "laws of nature, physical phenomena, and abstract ideas." *Bilski*, 130 S. Ct. at 3225 (citation omitted). *See also Association for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013).

As the Court acknowledged in *Bilski*, although these judicial exceptions can be traced to cases "going back 150 years," they "are not required by the statutory text . . . ." 130 S. Ct. at 3225. Nor has this Court ever suggested that these exceptions are required by Section 101's purposes or its legislative history. The judicial exceptions to Congress's expansive definition of patent-eligible subject matter thus lie at the farthest edge of the judicial power, perilously close to the border separating permissible interpretations of statutes from impermissible encroachments on Congress's Article I authority.[12] *Cf. Western Union Tel. Co. v. Lenroot*, 323 U.S. 490, 514 (1945) ("[T]he judicial function does not allow us to disregard that which Congress has plainly and constitutionally decreed and to formulate exceptions which we think, for practical reasons, Congress might have made had it thought more about the problem."). If that constitutional line is to be respected, it is essential that the judicial exceptions to Section 101's intentionally expansive language be construed narrowly and applied only in the clearest cases.

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[12] This Court in *Chakrabarty* identified the border separating the judicial and legislative powers in the specific context of interpreting Section 101: "Congress has performed its constitutional role in defining patentable subject matter in § 101; we perform ours in construing the language Congress has employed. In so doing, our obligation is to take statutes as we find them, guided, if ambiguity appears, by the legislative history and statutory purpose." 447 U.S. at 315. *See also Bilski*, 130 S. Ct. at 3226 ("This Court has more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed." (quotation marks omitted)). Given that the judicial exceptions to patent eligibility are not required by "the language Congress has employed" in Section 101, it appears that they can be justified, if at all, only as a matter of *stare decisis*.

B. It Is Particularly Important To Read the Judicial Exception for "Abstract Ideas" Narrowly.

As noted (*see* note 3, *supra*), while Petitioner reads *Bilski* as following in the footsteps of previous decisions applying the "abstract ideas" exception to patent claims reciting "fundamental or mathematical truths," Pet. Br. 26, the decision can also be read as applying that exception beyond the narrow realm of such truths, and into the limitless realm of all ideas.

Scientific truths are categories of human knowledge that are relatively easy to define, and thus to identify. A law of nature either is or it is not. So too for a physical phenomenon and a mathematical formula expressing a scientific truth. And a patent that recites such a scientific truth may thus seek essentially to monopolize a "basic tool[ ] of scientific and technological work," *Mayo*, 132 S. Ct. at 1293 (quoting *Benson*, 409 U.S. at 67). But the same cannot be said for "abstract ideas" that go beyond such scientific truths. An abstract idea in this general sense is *any* human thought that has not been reduced to some specific, concrete practice or application. And at the core of *every* invention is an abstract idea. As four members of the court below observed, "[a]ny claim can be stripped down, simplified, generalized, or paraphrased . . . until at its core, something that could be characterized as an abstract idea is revealed." *CLS Bank*, 717 F.3d at 1298 (Rader, C.J., *et al.*, concurring in part and dissenting in part); *see also Myriad*, 133 S. Ct. at 2116; Alan L. Durham, *The Paradox of "Abstract Ideas,"* 2011 UTAH L. REV. 797, 797 ("*Durham*") ("[I]n an important sense, every patent claims an abstract idea.

The subject matter of a patent is an invention. An invention is a concept – an idea for new technology.").

Thus, although the plurality was correct to observe that "a person cannot truly 'invent' [a] . . . scientific truth," it was wrong to suggest that a person cannot invent an abstract idea that is not a scientific truth. *See CLS Bank*, 717 F.3d at 1283. Scientific truths are the products of nature. "[A] scientific principle . . . reveals a relationship that has always existed." *Flook*, 437 U.S. at 593 n.15. Ideas, however, are the products of human ingenuity. Indeed, in a very real sense, cognition – the ability to form ideas – is a fundamental defining characteristic of humans. As this Court observed in *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 60 (1998), "[t]he primary meaning of the word 'invention' in the Patent Act unquestionably refers to the inventor's conception rather than to a physical embodiment of that idea." Patenting ideas thus does not pose an inherent danger of monopolizing "the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67.

Because an "abstract idea," in this sense, is at the root of every invention, there are enormous stakes riding on how one determines when a claimed invention is too "abstract." Therefore, it is very important to avoid vague or difficult to apply tests for the "abstract ideas" exception – otherwise Section 101 challenges will become *de rigueur* in patent disputes and there will inevitably be inconsistent or irreconcilable decisions, as illustrated by the warring opinions below. As Judge Newman trenchantly observed: "With today's judicial deadlock, the only assurance is that any successful innovation is likely to be challenged in opportunistic litigation, whose result will depend on the random selection of the panel." *CLS Bank*, 717 F.3d at 1321 (Newman, J., concurring in part and dissenting in part). Similarly, a broadly or loosely defined abstract ideas exception would pose a much more serious risk of the courts or the PTO unintentionally usurping Congress's constitutional authority over the designation of patent-eligible subject matter.

Finally, as discussed below, "[t]he § 101 patent-eligibility inquiry is only a threshold test." *Bilski*, 130 S. Ct. at 3225. It was not intended by Congress to screen out all claimed inventions that are undeserving of patent protection, but was instead designed to serve as at best a "coarse eligibility filter." *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 869 (Fed. Cir. 2010). Even if a claimed invention qualifies as one of the four eligible subject matter categories identified in Section 101, it must also satisfy "the conditions and requirements of this title," including the conditions governing patentability stated in provisions such as Sections 102, 103, and 112. *Bilski*, 130 S. Ct. at 3225. These other provisions supply powerful and discriminating tools for rejecting or invalidating "bad" patents. *See, e.g.*, *Research Corp.*, 627 F.3d at 869. *See also Durham*, 2011 UTAH L. REV. at 845-47.

III. PATENT CLAIMS TO COMPUTER-IMPLEMENTED INVENTIONS THAT DO NOT RECITE SCIENTIFIC TRUTHS ARE PATENT ELIGIBLE UNDER SECTION 101.

In light of the text and history of Section 101, the "abstract ideas" exception cannot reasonably be read to reach computer-implemented inventions. A patent claim that reduces an otherwise "abstract" idea to practical, beneficial application through the use of such tangible technology cannot be considered impermissibly "abstract," at least without stripping that term of all meaning. Consistent with this reasoning, this Court's precedents (both before and after the 1952 Act) have consistently distinguished between inventions claiming a scientific truth or an abstract idea itself and inventions claiming the practical *application* of such an idea. This distinction, which is the primary touchstone of any inquiry regarding whether a claim is too "abstract," compels the conclusion that computer-implemented inventions do not fall under the "abstract ideas" exception. Finally, notwithstanding the assertions of those proposing a broad reading of the "abstract ideas" exception, a clear rule acknowledging the patent eligibility of computer-implemented inventions that do not recite scientific truths poses little danger that "bad" patents will overwhelm the system; the Patent Act provisions that directly speak to the *patentability* of claims will remain powerful tools to weed out those "inventions" that are not qualified for the protection of the patent laws.

A. This Court's Pre-1952 Precedents Consistently Distinguish Between Ineligible "Principles" And Eligible "Applications" Of Those Principles.

From its earliest decisions, this Court has distinguished between a "principle," which may not be patented, and a beneficial "application" of that principle, which may. The scope of ineligible "principles" was historically narrow, and the early decisions relied upon by the modern Court emphasize that a claim is eligible so long as it applies or implements the principle in a beneficial way.

This Court explored the principle-application distinction in *O'Reilly v. Morse*, a decision upholding seven of Morse's eight patent claims related to the telegraph. 56 U.S. 62, 112 (1853). The Court rejected Morse's eighth claim, which sought to patent the natural phenomenon of electromagnetism "*however developed*, for making or printing intelligible characters, letters, or signs, at any distances . . . ." *Id.* at 86 (emphasis added). The Court explained that this claim was "too broad" because it claimed inventions "which he has not described and indeed had not invented, and therefore could not describe when he obtained his patent." *Id.* at 113. But the Court expressed no similar overbreadth concern with Morse's seven other claims, all of which embodied some application of a principle. For example, the Court approved Morse's first claim for "making use of the motive power of magnetism" – an otherwise ineligible "principle" – when applied "as means of operating or giving motion to machinery, which may be used to imprint signals upon paper or other suitable material, or to produce sounds in any desired manner, for the purpose of telegraphic communication at any distances." *Id.* at 85. The Court also approved Morse's fifth and sixth claims, even though they essentially claimed an entire language of dots and dashes when used for telegraphic purposes. *Id.* at 86. *Morse* thus distinguished between the patent-ineligible scientific principle of electromagnetism and any practical application, even if quite broad, of that principle.

In *Le Roy v. Tatham*, the Court famously observed that "[a] principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." 55 U.S. 156, 175 (1852). But the Court was quick to add that "the invention is not in discovering [scientific truths], but in *applying them* to useful objects." *Id.* (emphasis added). The "principle" in *Le Roy* was again a scientific truth – how heat operates upon lead – and the word "abstract" was used essentially to mean "not applied through any medium." *See also Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874) ("An idea *of itself* is not patentable, but a new device by which it may be made practically useful is." (emphasis added)).

The Court's 1880 decision in *Tilghman v. Proctor*, 102 U.S. 707 (1880), also suggests a narrow ambit for judicial exceptions to statutory subject matter. The Court upheld a patent for a process for dissolving oily materials under high temperature and pressure, even though the patent was not limited to implementation through any particular device. *Id.* at 718. Once again stressing that the patent claimed the *application* of the newly-discovered scientific truth, the Court explained that the inventor claimed a "process" rather than a "principle" because the claim described "a process by which a principle is applied to effect a useful result." *See id.* at 724.

Early Twentieth Century decisions relied upon by the Court's more recent decisions further confirm the critical difference between ineligible principles reciting scientific truths and eligible applications of those principles. For example, in *Mackay Radio*, the Court stated that "[w]hile a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." 306 U.S. at 94. In *Funk Brothers Seed Company v. Kalo Inoculant Company*, the Court similarly explained that "[h]e who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from *the application of the law of nature to a new and useful end.*" 333 U.S. 127, 130 (1948) (emphasis added). Finally, in *United States v. Dubilier Condenser Corporation*, the Court observed that "the act of invention" consists "neither in finding out the laws of nature, nor in fruitful research as to the operation of natural laws," but instead "in discovering how those laws may be utilized or applied for some beneficial purpose, by a process, a device, or a machine. *It is the result of an inventive act, the birth of an idea and its reduction to practice* . . . ." 289 U.S. 178, 188 (1933) (emphasis added).

In sum, this Court's decisions pre-dating the 1952 Act provide no foundation for the robust "abstract ideas" exception pressed by Respondents and some members of the Federal Circuit. The patent-ineligible "principles" in these early cases were scientific truths such as the natural phenomena of electromagnetism and the effect of heat upon a certain substance. Moreover, these cases make clear that any invention that reduces such an otherwise ineligible principle to some practical, beneficial application is patent eligible.

B. This Court's Post-1952 Section 101 Decisions Confirm that Computer-Implemented Technologies Are Patent-Eligible Subject Matter.

In a trio of decisions applying Section 101 of the 1952 Act to patent claims related to computers (and software in particular), the Court adopted the modern formulation that an "abstract intellectual concept" or "abstract idea" falls outside the bounds of patent-eligible subject matter. Those decisions in fact support the continued vitality of the familiar principle-application distinction and the conclusion that a patent claiming the beneficial application of an idea through computer technology falls squarely within the scope of patent-eligible subject matter. The patent claims in all three cases recited a scientific truth.

The first case was *Benson*, where the Court held that a mathematical formula for converting binary-coded decimal ("BCD") numerals into binary numbers could not be patented, because it simply expressed what the Court found to be a scientific truth. 409 U.S. at 71-72. Relying on earlier decisions discussed above, the Court observed that "[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Id.* at 67.[13] But the Court reiterated the rule that "the *application* of the law of nature to a new and useful end" may be patented. *Id.* (emphasis added) (citation omitted). Significantly, although the formula "ha[d] no substantial practical application except in connection with a digital computer," *id.* at 71, the claimed formula was not limited in application "to any particular art or technology, to any particular apparatus or machinery, or to any particular end use," *id.* at 64. Indeed, the Court explained that the claim could even "be performed without a computer." *Id.* at 67. The Court invalidated the patent on the ground that the claim wholly pre-empted a mathematical truth. *Id.* at 71-72.

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[13] One commentator has noted that "the authorities cited . . . throughout the *Benson* opinion deal with principles or phenomena of nature. They do not refer, at least in the same terminology, to 'abstract intellectual concepts.' " *Durham*, 2011 UTAH L. REV. at 814.

In *Flook*, the Court explained that the rule of *Benson* that "the discovery of a novel and useful mathematical formula may not be patented" cannot be circumvented by simply identifying "a limited category of useful, though conventional, post-solution applications of such a formula . . . ." 437 U.S. at 585. The patentee in *Flook* attempted to patent a mathematical formula but limit his claim only to the application of the formula in one context (the catalytic chemical conversion of hydrocarbons). *Id.* at 586. The Court suggested that the patent could potentially cover known and unknown uses of the formula in the context of processes for catalytic conversion. *See id.* ("the claims cover a broad range of potential uses of the method"). The underlying equation in the claim merely expressed a "scientific principle." *See id.* at 593 n.15 ("The underlying notion is that a scientific principle, such as that expressed in respondent's algorithm, reveals a relationship that has always existed."). The Court rejected the patent on the ground that it effectively claimed the unpatentable mathematical formula itself. *Id.* at 590.

The reasoning of *Flook* makes clear that, even stretched to their limit, both *Flook* and *Benson* extend no further than a patent reciting implementation on a computer of a mathematical expression of a scientific truth, and that those decisions do not speak to the eligibility of patent claims reciting the computer implementation of "ideas" that spring from human invention – *i.e.*, those not directed to scientific truths. *Flook* did not question the time-honored distinction between unpatentable principles and patentable applications, though it explained that "[t]he line between a patentable 'process' and an unpatentable 'principle' is not always clear." *Id.* at 589. The decision in *Flook* turned on the observation that the mathematical formula must be "treated as though it were a familiar part of the prior art," *id.* at 592, because scientific truths "are not the kind of 'discoveries' that the statute was enacted to protect," *id.* at 593. The Court emphasized that "[t]he underlying notion is that a scientific principle, such as that expressed in respondent's algorithm, *reveals a relationship that has always existed*. . . . Such 'mere' recognition of a theretofore existing phenomenon or relationship carries with it no rights to exclude others from its enjoyment." *Id.* at 593 n.15 (emphasis added) (citation omitted).

But the same cannot be said for human "ideas," for such ideas do not describe "a relationship that has always existed." Two centuries of patent law confirm that the practical, beneficial *application* of an idea through tangible elements such as computers and software may be patented. For the same reason, patents directed to the practical application of ideas do not carry the same risk posed by patents reciting scientific truths that "the public [will be] deprived of any rights that it theretofore freely enjoyed." *Id.* (citation omitted).

In *Diehr*, the Court clarified that the holdings of *Benson* and *Flook* are limited to patents that effectively claim a scientific truth itself, and that where the patentee claims a particular beneficial process (in *Diehr*, a process for curing rubber), the invention satisfies Section 101 even if it requires, as one step in the process, the application of such a mathematical formula. 450 U.S. at 187. The Court explained that the patent in *Flook* was invalid because it claimed nothing more than the formula itself, *see id.* at 186-87 & 192 n.14, whereas the patent in *Diehr* was simply "a physical and chemical process for molding precision synthetic rubber products," *id.* at 184, and the eligibility of that process was "not altered by the fact that in several steps of the process a mathematical equation and a programmed digital computer are used," *id.* at 185. While Diehr's claim recited the Arrhenius equation, a claim that "implements or applies [a mathematical] formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect" satisfies the requirements of section 101. *Id.* at 192. And the Court concluded that "a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer. . . . It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* at 187 (emphasis in original).

Bilski was the next case to meaningfully discuss the "abstract ideas" exception. The claims in *Bilski* were directed to steps for hedging the risk of price fluctuations, both in commodity markets in general and the energy markets in particular. 130 S. Ct. at 3223-24.[14] The patent examiner found that the claimed hedging idea was "not implemented on a specific apparatus" and was "without any limitation to a practical application." *Id.* at 3224. Thus, the claims were broad enough to cover *all* applications of the idea, both known and unknown. The PTO even suggested that the claims could be performed solely through mental steps. *See id.* This Court held that the patent sought to claim an ineligible abstract idea itself, for it would "pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea." *Id.* at 3231.

As noted earlier, although Petitioner reads *Bilski* as rejecting a patent claim that recited a "fundamental or mathematical truth," Pet. Br. 26, the claims in *Bilski* can also be read as reciting an "abstract idea" – the "basic concept of hedging," *Bilski*, 130 S. Ct. at 3231 – that is not a scientific truth. But such a reading of the *Bilski* claims does not call into question the eligibility of Petitioner's claims here, or any other computer-implemented invention not directed to a scientific truth. Because the patent in *Bilski* claimed "a monopoly over an abstract idea," *Bilski*, 130 S. Ct. at 3231, "*without any limitation to a practical application*," *id.* at 3224 (emphasis added), the decision in *Bilski* thus falls squarely within the time-honored distinction between unpatentable "principles" and patentable "applications" of those principles. No claim in *Bilski* recited a computer or other tangible element. If the patent claims had been limited to concrete, practical application through computer technology, they surely would have qualified as patent eligible under Section 101. *Bilski* is thus fully consistent with the rule that claims covering computer-implemented inventions are not "abstract."

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[14] "Claim 1 describe[d] a series of steps instructing how to hedge risk. Claim 4 put[ ] the concept articulated in claim 1 into a simple mathematical formula." *Id.* at 3223.

Here, Petitioner's patents do not recite an unpatentable scientific truth, but instead recite a patentable human "idea" in the literal sense – a particular process for reducing settlement risk – and require that the idea be implemented using tangible computing elements. Accordingly, they are directed to eligible subject matter under Section 101.

C. The Patent Eligibility Inquiry Under Section 101 Should Not Be Conflated with the Patentability Inquiry Governed by Other Provisions of the Patent Act.

Respondents and their *amici* argued below that a broad "abstract ideas" exception is necessary to reject or invalidate "bad" patents that are undeserving of the protection of the patent system. This argument inflates the intentionally limited office of Section 101, and ignores the multiple powerful tools provided by other provisions of the Patent Act that are directly geared to the determination of whether a patent should issue for a particular claimed invention. The argument thus improperly conflates the *patent eligibility* inquiry under Section 101 with the *patentability* concerns that are the province of other sections of the Act.

By its very terms, Section 101 identifies the subject matters that are eligible for a patent, "subject to the conditions and requirements of this title." 35 U.S.C. § 101. A patent claim that passes the threshold test of patent eligibility thus must also satisfy the "conditions and requirements" for patentability, such as novelty (Section 102), nonobviousness (Section 103), and specificity (Section 112). *See also Diehr*, 450 U.S. at 189 ("Section 101 . . . is a general statement of the type of subject matter that is eligible for patent protection. . . . Specific conditions for patentability follow and § 102 covers in detail the conditions relating to novelty.").

An expansive reading of the "abstract ideas" exception is therefore not needed to protect against "bad" patents. Indeed, Section 101 was likely not even needed to reject the claims in *Bilski*. Given that "[h]edging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class," *Bilski*, 130 S. Ct. at 3231 (citation and quotation marks omitted), the patent almost certainly would have been rejected on novelty grounds. *See also id.* at 3235-36 (Stevens, J., concurring) (the majority's abstract idea analysis addresses concerns better dealt with under Sections 102 and 112); *Lemley*, 63 STAN. L. REV. at 1342 ("There were many, many ways to reject Bilski's claim 1."). Likewise, inventions that do nothing more than use a computer to implement time-worn concepts in obvious and traditional ways will not receive patent protection notwithstanding the fact that they concern eligible subject matter.

Contrary to the arguments made by some,

Mayo does not support the importation of novelty, nonobviousness, and other patentability criteria into the "abstract ideas" analysis under Section 101. That case involved a patent that "set forth laws of nature – namely, relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm." *Mayo*, 132 S. Ct. at 1296. Read in context, *Mayo's* recognition that for some patent claims implicating laws of nature, the Section 101 patent eligibility inquiry "might sometimes overlap" with the novelty analysis under Section 102, *id.* at 1304, was quite limited in scope. The Court made this observation in the course of rejecting the Government's argument that it was sufficient, under Section 101, to couple a law of nature with "*virtually any* [other] step beyond a statement of a law of nature . . . ." *Id.* at 1303 (emphasis added). The statement in *Mayo* thus is limited to situations where a court is assessing a claim directed to a scientific truth and whether an additional element beyond that truth is sufficient to save the claim. And because a scientific truth cannot, by definition, be invented, such scientific truths can properly be viewed "as if they were part of the prior art." *See id.* at 1304. It is obviously *not* appropriate to treat a new "idea," conceived through human ingenuity, as prior art. In short, nothing in *Mayo* rejects this Court's observation in *Diehr* – a case favorably relied upon by the Court in *Mayo* – that the "question . . . whether a particular invention is novel is wholly apart from whether the invention falls into a category of statutory subject matter." *Diehr*, 450 U.S. at 190 (citation and quotation marks omitted).

By drafting Section 101 in broad and permissive terms, Congress decided that "ingenuity should receive a liberal encouragement," *see Chakrabarty*, 447 U.S. at 308, and that uncertainty about whether a patent addresses eligible subject matter should be resolved in favor of the patentee. Any concern about the granting of "low quality" patents is no reason to empower judges to use the blunt instrument of Section 101's identification of eligible subject matter to make what are in effect policy judgments about the appropriate scope of patent protection or predictions regarding which technologies are or are not in need of patent protection to spur research and innovation. Such questions "involve[ ] the balancing of competing values and interests, which in our democratic system is the business of elected representatives." *Id.* at 317.

CONCLUSION

The exception to Section 101 that is implicated here – the exception for "abstract ideas" – merely asks whether a claim fails to recite tangible elements, such as computing elements. The exception to Section 101 set forth in this Court's precedents dealing with "laws of nature, physical phenomena and mathematical formulas" (*i.e.*, claims directed to scientific truths), is not implicated in this case. Because Petitioner's claims are not directed to scientific truths and recite tangible computing elements, the claims easily satisfy Section 101. Accordingly, this Court should reverse the judgment of the Federal Circuit.

Respectfully submitted,

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APPENDIX

LIST OF *AMICI CURIAE*

Amicus Trading Technologies International, Inc. ("TT"), founded in 1994, makes derivatives trading software and execution solutions for professional traders. TT's software is purchased by premier investment banks, brokers, Futures Commission Merchants, hedge funds, proprietary trading firms, and other trading institutions, and is used each day by thousands of traders to access dozens of electronic exchanges around the world. TT is headquartered in Chicago and employs approximately 450 people worldwide. TT has additional offices in New York, Stamford, Houston, Sao Paulo, London, Geneva, Frankfort, Singapore, Hong Kong, Tokyo, and Sydney. TT invests heavily in research and development and has obtained patents covering various features of its products. TT relies on its patents to protect its investment in research and development. Most of TT's patents are directed to computer-implemented inventions, and many of its patents are directed to novel software-implemented tools used by traders to execute and manage orders.

Amicus Cantor Fitzgerald, L.P. ("Cantor") is a preeminent capital markets investment bank and broker dealer, as well as a premier global financial services firm. Cantor invests heavily in new products and new companies, including financial services, gaming, and consumer services. It relies on its patent portfolio to protect its investments, especially with respect to computer-implemented technology. Importantly, (a) Cantor builds what it invents and uses the software it builds; (b) its products require immense investment in design, coding, testing, regulatory approval, and marketing; and (c) it manages investment and product-build decisions based in significant part on patent protection. Its technologies require substantial investment to bring to market—but once Cantor has blazed the trail, the path for followers is clear and much less expensive, and their cost of regulatory approval, creating demand, and educating customers is far lower, often near zero. Cantor fundamentally relies on the patent system – it can only make high fixed-cost software investments if there is a reasonable expectation of profit, and that requires significant protection against free-riders. Patents are one of the key components of that protection. If patent protection is weakened for software inventions, then the ability of Cantor and similar companies to invest in complex software may be reduced, and many products and services may not come to market.

Amicus Cummins Inc. ("CMI"), a publicly-traded company, is a leading global power provider that designs, manufactures, distributes, and services diesel and natural gas engines, engine-related component products, including emission solutions, filtration, fuel systems and air handling systems, and power generation products, including electric power generation systems and related products. Cummins was founded in 1919 as one of the first manufacturers of diesel engines and is headquartered in Columbus, Indiana. Cummins sell its products to original equipment manufacturers, distributors, and other customers through a worldwide network of more than 600 company-owned and independent distributor locations and approximately 6,500 dealer locations in more than 190 countries and territories. At

Cummins, innovation is a fundamental core value, and Cummins has consistently invested in research and development and cutting-edge technology to sustain its leading edge. As an industry leader, Cummins relies on its extensive patent portfolio, including computer-related patents, to protect its significant investment in research and development.

Amicus Scientific Games Corporation ("Scientific Games") (NASDAQ:SGMS), headquartered in New York City, is a leading innovator in the global lottery and regulated gaming industries. Through the knowledge and experience of over 3,500 employees, Scientific Games serves customers from advanced-technology manufacturing and operational facilities in North America, South America, Europe and Asia, with additional facilities located throughout the United States and around the world based on customer requirements. Scientific Games invests heavily in research and development to create new and innovative computer- and software-related technology and relies on patents to protect those innovations. WMS Gaming Inc. is a wholly owned subsidiary of Scientific Games Corporation. WMS Gaming has been a leader in interactive entertainment since Harry Williams founded WMS Gaming's predecessor company in 1943. A Stanford University-trained engineer who devised the "tilt" mechanism for pinball machines, Williams changed forever the nature of pinball in America. The Company brought this spirit of innovation to the home video market in the 1980s and to the casino gaming industry in the early 1990s. Today, through its online interactive business, WMS is also developing products, services, and end-to-end solutions that address global online wagering, casual, social, and mobile gaming opportunities. Many of WMS Gaming's innovations are software implemented and WMS Gaming relies upon patents to protect these innovations. Scientific Games owns over 900 patents and has one of the largest patent portfolios in the gaming industry.

Amicus Align Technology, Inc. ("Align") is a publicly-traded global medical device company headquartered in San Jose, California, with approximately 3,175 employees worldwide. Align pioneered the invisible orthodontics market with the introduction of the patented Invisalign® system in 1999. The Invisalign® system is a combination of proprietary virtual treatment modeling software and removable clear aligners based on rapid manufacturing processes and mass customization, much of which is covered by patents in the United States and many other countries. Align has also developed, and sells, other innovative, technology-rich products, such as the highly innovative Itero™ Scanner and OrthoCAD CAD-CAM services. Align's ability to continue to innovate and grow in the digital dental area is significantly dependent on its ability to protect its innovations by intellectual property rights. Many of Align's past and projected future innovations and inventions have and will embody computer-implemented processes, machines, and systems.

Amicus Alcatel-Lucent has operations in over 100 countries and had approximately 72,000 employees at the end of 2012. Alcatel-Lucent is the world's first truly global communications solutions provider, with the most complete, end-to-end portfolio of solutions and services in the industry. Alcatel-Lucent provides products and innovations in IP and cloud networking, ultra-broadband fixed and wireless access for service providers and their customers, as well as enterprises and institutions throughout the world. Alcatel-Lucent's Bell Labs, one of the world's foremost technology research institutes, is responsible for countless breakthroughs that have shaped the networking and communications industry. In 2013, Alcatel-Lucent obtained more than 3,000 patents worldwide, resulting in a portfolio of more than 32,000 active patents and approximately 14,900 patent applications totaling approximately 47,000 issued and pending patents worldwide across a vast array of technologies. Alcatel-Lucent considers patent protection to be critically important to its businesses due to the emphasis on research and development and intense competition in its markets.

Amicus CoreLogic (NYSE: CLGX) is a publicly traded company headquartered in Irvine, California, with over 5,000 employees worldwide. CoreLogic is a leading property information, analytics and services provider in the United States and Australia. The company's combined data from public, contributory and proprietary sources includes over 3.3 billion records spanning more than 40 years, providing detailed coverage of property, mortgages and other encumbrances, consumer credit, tenancy, location, hazard risk, and related performance information. The markets CoreLogic serves include real estate and mortgage finance, insurance, capital markets, transportation, and government. CoreLogic delivers value to clients through unique data, analytics, workflow technology, advisory, and managed services. Clients rely on CoreLogic to help identify and manage growth opportunities, improve performance, and mitigate risk. CoreLogic relies on patents, amongst other intellectual property, to protect its innovations and investments in research and development ("R&D") and has various U.S. patents and patent applications covering computer-implemented innovations in its products.

Amicus Aristocrat Technologies Australia Pty. Ltd. ("Aristocrat") is an Australian-based and publically listed company that employs approximately 800 people in the United States and over 2,000 people across the globe. Aristocrat is a leading manufacturer and supplier of gaming equipment to the casino industry and has major operations in the United States, Canada, South America, Europe, Asia, and Australia. The gaming industry is an extremely competitive industry and one that requires relentless product innovation in order to remain competitive. Because of this, Aristocrat invests significant resources into its R&D activities. With a global patent portfolio exceeding 1000 issued patents and pending applications, Aristocrat's future is dependent on a robust and enforceable patent portfolio that maximizes the commercial return on its R&D investment.

Amicus Bancorp Services, LLC ("Bancorp"), founded in 1993, assists large financial institutions and Fortune 500 companies by developing innovative structured financial products to meet the unique needs of its clients. The USPTO has granted Bancorp patents on novel computer systems, media, and processes that administer those complex financial products with automated functionality requiring specially programmed computers. Bancorp has placed and currently services and administers structured financial products, with particular emphasis on specialized computer administration platforms. Bancorp's patented computer administration systems are specifically designed to support daily valuation and other automated functionality for hedge funds, nonqualified deferred compensation plans, and separate account life insurance policies with stable value protection.

Amicus NAGRA USA, Inc., a subsidiary of the Kudelski Group (SIX:KUD.S), provides security and multiscreen user experience solutions for the monetization of digital media. The company offers content providers and DTV operators innovative and patented secure, open, integrated platforms and applications over broadcast, broadband and mobile platforms, enabling compelling and personalized viewing experiences. The Kudelski Group also offers cyber security solutions and services focused on helping companies worldwide protect their data and systems and is additionally well known as a technology leader in the area of physical access control and management of people or vehicle access at sites and events. As a result of over 60 years of innovation and substantial investment in the hardware and software-based technologies it provides, the Kudelski Group holds over 4,300 issued and pending patents worldwide. The Group employs approximately 400 people in the United States (and 3000 worldwide) and is headquartered in Cheseaux-sur-Lausanne, Switzerland. Please visit www.nagra.com for more information.

Amicus BGC Partners, Inc. ("BGC") is a spin-off of Cantor Fitzgerald, L.P., and is a publicly-owned holding company of global brokerage businesses primarily servicing wholesale financial and real estate markets. Its products include fixed income securities, interest rate swaps, foreign exchange, equities, equity derivatives, credit derivatives, commercial real estate, commodities, futures, and structured products. BGC also provides a wide range of services, including trade execution, broker-dealer services, clearing, processing, information, and other back-office services to a broad range of financial and non-financial institutions. BGC relies on its patent portfolio, especially with respect to computer-implemented technology. BGC can only make high fixed-cost software investments if there is a reasonable expectation of profit. Patent protection is one of the key components in making those investments. If patent protection is weakened for software inventions, then the ability of BGC to invest in complex software may be reduced.

Amicus Fallbrook Technologies Inc. ("Fallbrook") is a technology development company that designs and manufactures advanced transmission systems. Its core technology, NuVinci®, is a traction-based continuously variable planetary drive (CVP) that is scalable to a variety of applications, ranging from bicycles to automobiles and industrial machinery. Over the past 12 years, Fallbrook has built an extensive portfolio of over 600 patents and patent applications worldwide from its research and development efforts. Robust patent protection provides Fallbrook and its licensees a sustainable competitive advantage that provides the necessary security to support the significant investment by the

Company's investors and licensees required to develop transmissions for the public that more efficiently and effectively utilize energy in vehicles and industrial equipment.

Amicus Architecture Technology Corporation ("ATCorp") is a high technology small business engaged in research, development, engineering, and services. ATCorp employs approximately 100 people at three different locations in the United States. ATCorp's software-intensive solutions provide government and commercial clients with the flexibility to "customize" new, existing, and legacy systems with features that meet or exceed their next generation requirements. ATCorp has developed innovative software-based products and has distributed them to thousands of users worldwide. ATCorp's Systems Engineering and Software Development groups specialize in specification, development, integration, and evaluation of high-performance, network-centric, safety-critical computing systems for the military and air traffic sectors. Due to the unique design and features of ATCorp software products, more than 15 patents have been granted since 2003. Government and commercial clients rely on ATCorp to provide key software components to next generation network systems providing advanced capabilities and protection against the growing threat of "cyber-attacks."

Amicus Sonitus Medical Inc. ("Sonitus") is a privately held medical device company with 82 employees located in San Mateo, California. Sonitus is focused primarily on the development of innovative technologies for the treatment of hearing disorders. Sonitus' lead product, the SoundBite™ Hearing System ("SoundBite"), is the world's first non-surgical and removable hearing solution that imperceptibly transmits sound via the teeth. Currently FDA-cleared for the treatment of Single Sided Deafness and Conductive Hearing Loss, SoundBite has intended future indications for other hearing disorders such as mixed hearing loss and tinnitus. Additionally, SoundBite and SoundBite-related technologies are being developed for multiple communications applications, including applications suitable for certain government work as well as consumer uses. Sonitus has invested millions of dollars to create and maintain its broad patent portfolio. With 35 issued patents in the United States, Sonitus relies extensively on these issued patents to protect its core United States market and to attract venture and other forms of capital to finance the growth of its business. Sonitus strongly believes that robust and comprehensive United States patent laws and regulations are crucial to the success and future growth of its business.

Amicus Miramar Labs, Inc. ("Miramar") is owner of the miraDry System, a breakthrough non-invasive technology that utilizes microwave energy to safely eliminate underarm sweat. The miraDry System is the result of over five years of research and development, including a major long-term clinical study conducted by leading dermatologists across the United States. Miramar has over 80 employees and relies on patents to protect its computer controlled products.

Amicus Great Lakes NeuroTechnologies Inc. ("Great Lakes") (GLNeuroTech.com) understands that movement disorders, such as Parkinson's disease, represent a complex problem for patients, physicians, and researchers. Great Lakes produces a line of bioinstrumentation products that includes physiological monitors and patient-centered diagnostic and therapy systems integrated with wireless, remote, and web-based applications. By working together with customers, Great Lakes ensures the delivery of high quality products that fit customers' clinical and research requirements. Great Lakes' activities include research and development, engineering, manufacturing, distribution, and export of research systems and medical devices. It sells its products on all seven continents. Its major markets include physiological monitoring for research and education, movement disorders such as Parkinson's disease, telemedicine, and in-home health monitoring. Customers include physicians, medical technicians, healthcare practitioners, researchers, universities, and hospitals. Great Lakes has 26 employees, six issued patents with another about to be issued, 18 U.S. pending applications, and six PCT applications. The company was incorporated in 2010.

Amicus NeuroWave Systems Inc. ("NeuroWave") was incorporated in 2007 and is a medical device company, dedicated to developing innovative, state-of-the-art signal processing technologies for the next generation of brain monitors for improved and safer patient care. The NeuroSENSE® Monitor, the latest generation of brain monitors for patient-customized anesthesia and sedation, is now cleared for sale in markets recognizing the CE mark. NeuroWave's advanced brain monitors incorporate intelligent algorithms for the automated assessment of brain function for anesthesia/analgesia/sedation monitoring and seizure detection. New products for (1) real-time control and delivery of anesthetics and analgesics using electroencephalograms ("EEG") and (2) miniature EEG machines to help identify mild traumatic brain injury at the point of injury are being developed under United States Army and National Institutes of Health contracts. NeuroWave currently has eight employees, three patents with another about to be issued, twelve U.S. patents pending, and six PCT applications. Patents provide the bulk of the value of the company.

Amicus Flocel Inc. is a biotechnology company formed in 2004, dedicated to innovation towards helping the research community better conduct and advance in-vitro drug studies. In contrast to other available models of blood-brain barriers, Flocel's Dynamic In-Vitro Blood-Brain Barrier ("DIV-BBB") respects the anatomical aspects of the in situ endothelial cell-astrocyte interactions and replicates the physiological levels of shear stress to which in situ endothelial cells are exposed. The DIV-BBB allows formation of physiological transendothelial resistance, and formation of gap junctions that can be easily visualized by an electron microscope or determined experimentally with the use of tracers. Flocel has one issued patent and three pending patent applications. Even though the technologies are based on cellular testing, they are implemented with computer-based controls and use data processing to implement the results.

Amicus Cleveland Medical Devices Inc. ("CleveMed") was formed in 1990 and is leading the future in medical services and devices for portable sleep testing. From monitors for home sleep testing to full PSG, CleveMed aims to improve the delivery of care. Its web-based services and devices meet American Academy of Sleep Medicine guidelines, are easy for patients to use, streamline operations for healthcare providers, and offer cost-efficient solutions for payers. The company's SleepView product and service lowers the cost for an obstructive sleep apnea test by 75-90%, and the number of tests has been growing at 14% per month for two years. CleveMed has eighteen employees. The company has twelve patents and 23 pending patent applications covering computer hardware and software-based medical devices, data processing, and business methods. A large part of the company's valuation is based on these patents.

Amicus Orbital Research Inc. ("Orbital") was formed in 1990 and has 17 employees. Orbital develops and commercializes new and innovative custom-engineered solutions using its expertise in Aerodynamic Control Systems, Medical Devices, and Micro Electronic Devices for various commercial and military applications. Examples of Orbital's developments include new longer range, higher accuracy, lower cost weapons; chronic ECG electrodes and monitors; oxygen sensors used on high performance aircraft; and low cost, high temperature (250C) electronics. Orbital has 42 issued patents and 36 pending patent applications. Algorithms, software, data processing, and computer hardware play a significant role in company valuation.

Amicus Spectral MD™ is a clinical research stage medical device company based in Dallas, Texas. The company is developing patent-pending solutions to use light to visualize various skin conditions and improve health care delivery, procedures, and patient outcomes. The company received 510(k) clearance for its device last year and is continuing to improve its system with more research. The key to Spectral MD solutions originates from the systems–based technology that combines real–time digital analysis of optical signatures, thereby sensitizing an imager to photon–tissue interactions deep below the skin's surface. Spectral MD has received funding from the National Science Foundation and the federal government via a contract from a division of the Department of Health and Human Services. The company has six employees and is in the process of hiring more in order to fulfill the federal contract requirements and advance the technology.

Amicus Ameranth Inc., headquartered in San Diego, California, was formed in 1996 to develop and deploy wireless/web-based products primarily for the hospitality/casino markets. It has received numerous technology awards and widespread acclaim for its products. Its systems and products have been deployed in many leading restaurants, hotels, sports stadiums, and casinos. Ameranth has been awarded eight patents for its 21st Century Communications™-based products/systems. It currently has 27 companies that have licensed its patents.

Amicus RPost Communications has set the global standard for email proof with services built upon its patented Registered Email® technologies, which enable both sender and recipient to track, prove, sign, and encrypt high value messages and documents across desktop, mobile, and online email platforms. RPost software offered as a service employs these RPost technologies, and is used by the United States Government and global Fortune 500 companies. RPost, founded in 2000, has been granted more than 50 patents on its Registered Email technologies worldwide. RPost spends millions of dollars each year on research and development of new products and services. RPost relies on its patent portfolio to protect its investments. Accordingly, RPost has a strong interest in ensuring that the rules of the United States Patent & Trademark Office are interpreted correctly and that the patent laws provide for a strong patent system.

Amicus Enounce, Inc. offers products that allow users to speed up and slow down the rate of audio and video digital media while preserving intelligibility, pitch, and speaker identity. Enounce was founded in 1998 and leverages extensive research done at the Massachusetts Institute of Technology by its founding team and a portfolio of over 25 issued patents for the company's technology. Enounce licenses its patented technology in a modular software library that allows third parties to add variable speed playback to existing multimedia applications and devices.

Amicus ManyWorlds, Inc. is a small, high-tech business, headquartered in Houston, Texas, that is a leader in delivering adaptive knowledge and expertise discovery and personalization solutions for the enterprise. ManyWorlds' software products enable systems to anticipate, rather than just react to, users' needs, resulting in higher performing organizations in which just the right knowledge and expertise are continuously and pervasively delivered to the right people at the right time. ManyWorlds' market-leading products are the result of over ten years of pioneering R&D investments, which have also resulted in over twenty issued U.S. patents and many more pending.

Amicus FPX is a software company with a 30-year history that provides configuration, price, quote solutions ("CPQ") to the Global 500, including some of the largest companies in the world in manufacturing, telecommunications, healthcare, and financial services. FPX's products are mission critical as its solution touches every sale. FPX is credited with having invented CPQ solutions in 1983. FPX has continued to invest in research and development over the years, and has expanded into data management and data interaction solutions. Today FPX has over 120 employees in the United States alone.

Amicus Charles River Analytics Inc. ("Charles River"), which was founded in 1983, applies computational intelligence technologies to develop mission-relevant tools and solutions to transform customers' data into knowledge that drives accurate assessment and robust decision-making. Charles River is headquartered in Boston and employs around 130 people. Charles River continues to grow its technology, customer base, and strategic alliances through research and development programs for the Department of Defense and the Intelligence Community, addressing a broad spectrum of mission areas and functional domains, including: sensor and image processing, situation assessment and decision aiding, human systems integration, and cyber analytics. These efforts have resulted in a series of successful products that support continued growth in its core research and development contracting business, as well as the commercial sector. Charles River became an employee-owned company in 2012, to set the stage for the next generation of innovation, service, and growth. Charles River owns ten patents that protect its innovations.

Amicus Casino Gaming, LLC, is a Chicago, Illinois-based company that develops and licenses novel games to casinos, equipment manufacturers, and on-line wagering sites. The company relies on patents to protect its innovations.

Amicus Horizon Digital Finance LLC ("HDF"), through multiple websites (including www.myautoloan.com, www.onehourfinance.com, www.preferred-dealer.net, and www.mymotorcycleloan.com), is a Texas-based company that provides a direct-to-consumer, internet-based marketplace that helps consumers take control of the research, finance, and buy processes for automobiles, motorcycles, boats, recreational vehicles, home equity, and mortgages. HDF has been in business since 2003. HDF provides consumers with a secure, confidential process to obtain loan offers and provides a wide range of products and services to simplify the search for information and funding alternatives. HDF facilitates the matching of lenders based upon customer needs through a proprietary analysis and evaluation. These computer-implemented technologies and processes are protected by several United States patents (and pending applications) that are critical to the success and viability of HDF.

Amicus DDB Technologies LLC ("DDB") is an Austin, Texas-based company that was formed in the late 1990's. DDB (and its predecessor Instant Sports, Inc.) is a pioneer in the design and development of, among other things, technology that enables the broadcasting of live sporting events to a viewer's computer to enable the viewer to watch a computer simulation of that sporting event. This computer-implemented technology was adopted by virtually every sports broadcasting company and sports league. DDB relies on numerous United States patents to protect its technology and to attract investments, and would not be in existence without these patents.

Amicus Chief Experience Officer, Inc. ("CXO") is a consulting firm that advises start-ups and Fortune 500 corporate executives in intellectual property strategy and the design and development of hardware and software products. CXO was founded in 2005 and has been responsible for establishing user experience strategies for technologies ranging from medical informatics, financial services, legal research, and document management systems to touch screen remote controls, smartphones, and other media-rich devices.

Amicus MONKEYmedia, Inc. ("MONKEYmedia") is a privately-held user interface design studio based in Austin, Texas. Founded in 1994, MONKEYmedia researches, develops, and sells software that facilitates human-computer interaction. Example technologies range from virtual force-feedback interfaces and telescopic video advertising to multi-channel interactive environments that embody novel cinematic paradigms. MONKEYmedia relies on patents that it has obtained to protect its innovations. MONKEYmedia has also licensed patents to other companies.

Amicus ParkerVision, Inc. is a 50-person company with 35 engineers who innovate radio frequency ("RF") technologies designed to enable advanced wireless communications for current and next generation communication networks. ParkerVision's innovations are protected by almost 250 patents in both the United States and worldwide. Its technology has enabled products in the mobile phone industry, as well as WiFi, Bluetooth, and GPS products to achieve many important features used in today's mass-produced wireless products. Smaller size and lower cost RF transceivers, more efficient use of battery power, improved connectivity performance, and greater design simplicity are enabled by ParkerVision's innovations in Smartphones, WiFi and Bluetooth products, and GPS devices. Its protected innovations are the result of over 15 years of research and development funded by over $200 million invested in their development. Without the intellectual property protection of its innovations, ParkerVision could not justify the financial and time risks in making the R&D investment required to develop its wireless technologies.

Amicus Subtle by Design Co. has pioneering intellectual property in its premier product "The Garment Shield," which utilizes a patent pending methodology and product to protect fine washables through every day washing and drying. Subtle by Design's intellectual property helps it pave the way for pioneering solutions to protect purchasers' investments in their garments.

Amicus iQ4 LLC is committed to transforming the next generation workforce. iQ4, the United Nations Global Business Incubator, and the National Student Clearinghouse have teamed to solve the challenge of student employability, "closing the workplace skills gap," and will transform how employers hire their next generation workforce. Their mission specifically focuses on the design and delivery of content and expertise in the form of skills taxonomy, assessment, certifications, project curriculum, and verification to prepare skilled candidates for employment within the fields of aerospace, cyber security, information technology, business, law, finance, and construction of emerging countries. iQ4 has pending patents surrounding its unique digital application integration for member skills-based profiling (individual branding), employer driven search engines, and project collaboration.

Amicus Crowd Cart's unique e-commerce business organizes buyers through a disruptive technology focused on creating incentive structure to turn shoppers into buyers. Crowd Cart's patent strategy coupled with its novel technology allows Crowd Cart to uniquely position itself by creating a new market category of organically-generated user group buyers.

Amicus HouseTab, LLC, is a mobile payments application with a social engine. While there are many players coming into the Mobile Payments area, HouseTab knows that its patent pending technology is key and allows it to focus attention and innovation to both sides of the equation, the customer and the merchant, and bringing great value-add to both.

Amicus Neo Prime Solutions, Inc. ("Neo Prime") is a startup company providing custom cyber threat and risk assessment products and services to enterprise organizations. Neo Prime's products and services help organizations understand their potential loss from today's most prevalent cyber-threats, take action to enhance their security posture, and detect and contain cyber threats. Neo Prime's intellectual property enables it to combat growing risks to its clients' increasingly valuable intellectual property and systems.

Amicus TIP Solutions, Inc. ("TIP") is a Chicago, Illinois-based start-up software company that builds voice-focused software and firmware applications for smartphones. TIP has multiple United States and international issued and filed patents that claim computer-implemented inventions used in the company's products. TIP relies on its patents to protect its innovations and as an important factor to attract investments in the company.

Amicus Bi-Level Technologies is a startup company in Encinitas, California developing computer-based methods and algorithms. It specializes in signal representation technology for signal and image processing for the electronic print industry and for mobile display devices.

Amicus RedTxt.com.au Pty. Ltd. ("RedTxt") makes and sells SMS/TXT solutions for large and small communities. RedTxt's SMS/TXT solutions include, for example, publishing sporting event scores and advertising via SMS, an automated platform for sending Twitter messages to SMS, and a web-based platform that allows users to see in real-time the status of an SMS message. RedTxt has granted and pending United States Patents in the field of mobile applications that involve software and computers. Uncertainty in the law relating to patentability affects RedTxt's business strategies and therefore, shareholder value.

Amicus U.S. Startups and Inventors for Jobs ("USIJ") is an alliance of inventors, innovators, startup companies, and research institutions that have come together in the interest of safeguarding this nation's new product creation ecosystem. USIJ is deeply concerned about the current judicial and legislative environment, which makes it extremely difficult for innovative startup companies, inventors, and universities to protect their inventions by making patent litigation significantly more expensive, unpredictable, burdensome, and protracted. USIJ comes from a long line of inventors, startups, and universities who create the technologies and products that fuel future GDP and job growth.

Amicus Martin Goetz is currently a private investor and management consultant to software product firms. He was a founder (in 1959) and former President of Applied Data Research (ADR), a $200 million company that was traded on the New York Stock Exchange. His company was the first company to sell a software product commercially, and it pioneered the start of the software products industry. In 1968, Computerworld Magazine featured Mr. Goetz as the recipient of the first United States software patent. He is a leading advocate of software product protection through copyright and patent law, and his leading role in combating unfair competitive practices in software by hardware manufacturers is widely recognized. For the last 40 years, through articles and speeches, Mr. Goetz has helped promote the status and growth of the independent software industry.

Amicus Richard A. Epstein is the Laurence A. Tisch Professor of Law at New York University School of Law. He is also the James Parker Hall Distinguished Service Professor Emeritus of Law and Senior Lecturer at the University of Chicago Law School, and the Peter and Kirsten Bedford Senior Fellow at the Hoover Institution. Among other areas of expertise, he specializes in intellectual property law.

Amicus Daniel F. Spulber is the Elinor Hobbs Distinguished Professor of International Business and Professor of Strategy at the Kellogg School of Management, Northwestern University. He is also Professor of Law at the Northwestern University Law School. In addition to other articles and research in the field of intellectual property, he is author of "Should Business Methods be Patentable" (Spring 2011: Volume 3, Number 1 – Journal of Legal Analysis).

Amicus Jay P. Kesan is a professor at the University of Illinois College of Law and is the H. Ross & Helen Workman Research Scholar Director for the Program in Intellectual Property and Technology Law. Mr. Kesan's work focuses on patent law, intellectual property, entrepreneurship, and agricultural biotechnology law, among other areas. Mr. Kesan was appointed by federal judges to serve as a special master in patent litigations, and has served as a technical and legal expert and/or counsel in patent matters. He also serves on the boards of directors/advisors of start-up technology companies.